

S. HRG. 109-1138

**HURRICANE KATRINA  
AND COMMUNICATIONS INTEROPERABILITY**

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**HEARING  
BEFORE THE  
COMMITTEE ON COMMERCE,  
SCIENCE, AND TRANSPORTATION  
UNITED STATES SENATE  
ONE HUNDRED NINTH CONGRESS  
FIRST SESSION**

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**SEPTEMBER 29, 2005**

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED NINTH CONGRESS

FIRST SESSION

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## **HURRICANE KATRINA AND COMMUNICATIONS INTEROPERABILITY**

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**THURSDAY, SEPTEMBER 29, 2005**

U.S. SENATE,  
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,  
*Washington, DC.*

The Committee met, pursuant to notice, at 10:02 a.m. in room SD-562, Dirksen Senate Office Building, Hon. Ted Stevens, Chairman of the Committee, presiding.

### **OPENING STATEMENT OF HON. TED STEVENS, U.S. SENATOR FROM ALASKA**

The CHAIRMAN. We have a whole number of conflicts this morning, gentlemen, not the least of which is the final statements on the floor for the nomination of Judge Roberts, but also we have several conference committees meeting. And I doubt we're going to have great attendance here today. But the Senator from California and I might be able to stir it up a little bit.

[Laughter.]

The CHAIRMAN. We're going to have government witnesses this morning, and the afternoon witnesses will be industry witnesses. The afternoon session is scheduled to start at 2:30.

The recent hurricanes have shown that many first responders just cannot talk with one another, because their radios and communication networks have been inoperable. Achieving interoperability requires a great many things—coordination, planning, and training; expert equipment; proper standards; and the spectrum to make certain they have the best available communications.

Now, this is important, because, on a specific date, the broadcasters will be required to give their first responders 24 MHz of new spectrum in a 700 MHz band, including a portion of that for interoperability, exclusively. This Committee is working on that bill. We hope to be able to consider it next week. And we hope that will bring about some additional funds that we may be able to use to deal with the interoperability problems.

And I do want to thank the Louisiana delegation for their participation in this hearing. Senator Vitter agreed to chair the afternoon portion, because we have an appropriations bill on the floor this afternoon.

Let me turn to Senator Boxer to see if she has any comments.

**STATEMENT OF HON. BARBARA BOXER,  
U.S. SENATOR FROM CALIFORNIA**

Senator BOXER. Could you just repeat? You said there's going to be a bill that deals with interoperability. Could you just—I'm sorry, I was looking at my statement. I didn't hear the details of what you said.

The CHAIRMAN. If you're talking about the DTP bill, we're still wondering whether we can get the other bill done in time to take it up at the same time.

Senator BOXER. Thank you.

Well, Mr. Chairman, thank you very much for holding this hearing to shine a light on a shocking deficiency in our emergency communications system. And the time to find a solution is now. It was really yesterday. As a matter of fact, it was the day before yesterday, and we still haven't done it. We didn't learn our lesson after the 1993 World Trade Center bombing. We didn't learn it after September 11. The wildfires raging in California almost 2 years ago didn't teach us. And, parenthetically, I'm sad to report we've got a wildfire raging out of control, 9,000 acres, as we speak here, near Los Angeles, in the—not the very populated areas, but threatening populated areas. And, of course, as you mentioned, Hurricane Katrina shone a light on this.

First-responders to all these disasters were so challenged by the lack of interoperable communications that hundreds of lives were unnecessarily and tragically lost. And some of those lives are first responders themselves. Enough is enough. We don't need any more failures.

I'd like to just show you—and I only have 2 minutes left in my remarks—a chart here, Mr. Chairman. And I'd like the Chairman to take a look at this. If there was an accident on the Golden Gate Bridge, something really terrible, an emergency on the Golden Gate Bridge—and we know that our bridges have been targeted by al Qaeda, to just mention that—there are 17 different agencies that will respond to such—and they're all terrific. And they include the U.S. Coast Guard, they include local people, State people, and the rest—fire departments, police, highway patrol. Every one of these agencies is stellar. But most of them can't talk to one another. It's just really wrong. We have to fix it, it seems to me.

The CHAIRMAN. Senator, would you allow me to interrupt you?

Senator BOXER. Yes.

The CHAIRMAN. Do you know why? They all buy their radios from the lowest bidder.

Senator BOXER. Well, maybe we have to look into that.

The CHAIRMAN. Yes.

Senator BOXER. I tried to get funds for interoperable communications systems as part of the Rail Security bill. This Committee responded, everyone on this committee. But, somehow or other, it was dropped over in the House. And then, a really wonderful thing happened. In the intelligence bill—reform bill, with Senator McCain's help, we did pass an authorizing program for \$300 million a year, and again it was dropped, in conference.

So, we cannot seem to go right over that goal line, and that's what we need to do. And I hope, Mr. Chairman, because you are effective and such an important Member of the Senate, with your

help we will not ignore this anymore. If there are problems with procurement, if we have to look at those things, absolutely we should.

Thank you very much.

The CHAIRMAN. Thank you.

Our first panelist, Dr. Kenneth Moran, who's the Acting Director of the Office of Homeland Security, Enforcement Bureau, of the Federal Communications Commission; Dr. David Boyd, who is the Director of the Office for Interoperability and Compatibility, Department of Homeland Security; Willis Carter, of the Association of Public-Safety Communications Officials, APCO, and the Chief of Communications of the Shreveport Fire Department; and Dereck Orr, the Program Manager of the Public Safety Communications Systems, National Institute of Standards and Technology. I'm sorry if I read them as they're not seated at the table.

First, we will call on Senator Rockefeller to see if he has an opening statement.

Senator ROCKEFELLER. Oh, thank you, Mr. Chairman.

The CHAIRMAN. I didn't see you.

Senator ROCKEFELLER. I yield to Senator Sununu.

The CHAIRMAN. Were you here first? Sorry.

Senator SUNUNU. Under no circumstances would that be appropriate. Go ahead, Senator.

**STATEMENT OF HON. JOHN D. ROCKEFELLER IV,  
U.S. SENATOR FROM WEST VIRGINIA**

Senator ROCKEFELLER. Just to be very brief, the Conference of Mayors 2004 surveyed 192 cities: 44 percent reported an accident within the preceding year in which the lack of interoperable communications made response difficult, 49 percent of the cities are not interoperable with State police, 60 percent are not interoperable with their State Emergency Operations Centers, 83 percent are not interoperable with the Federal law enforcement agencies—to wit, FBI, ATF, Border Patrol, et cetera—89 percent believe that funding is the most significant way out of that.

We did have a couple of votes on the issue, which failed last year. And what happened in the Gulf Coast, I'm seeing on a much, much smaller scale in West Virginia. Everything is communication. Everything is communication. Leaders can't be leaders, mayors can't be mayors, governors can't be governors, county commissioners can't be county commissioners, much less EMS, unless they have a system that works and unless they can talk to each other.

I just think what's happening, Mr. Chairman, is just an enormous statement that if we want America to be strong, we've got to start right here in our own country, and we've got to start with the protection of our people. And that's called protecting our people in times of disasters of various sorts. And that's not just weather, that's—that can do with dirty war, you know, dirty bombs, things of that sort.

So, this is a very important hearing. Thank you.

The CHAIRMAN. Senator Sununu?

**STATEMENT OF HON. JOHN E. SUNUNU,  
U.S. SENATOR FROM NEW HAMPSHIRE**

Senator SUNUNU. Thank you, Mr. Chairman.

This is not my area of expertise, but I think, like most Americans, I assumed that the Federal support and assistance regarding interoperability had a bigger impact, at least than it appears to have had in the wake of Hurricane Katrina. I note, in one of the statements presented today, that the figure of \$1.5 billion is highlighted, money that's already been made available to state and local governments to deal with this problem. I know billions more have been made available for equipment grants through the COPS FAST and other equipment-based programs. There has been dramatic assistance to state and local agencies to deal with interoperability. And it is very unclear to me why we are so far behind the curve, or seem to be so far behind the curve, still today. I think everything that I have seen and read, and personal visits I have made with public safety officials at the state and local level indicate this is not new technology, that we are not trying to reinvent the wheel here. We're trying to develop or implement basic standards, basic systems so that we have the most seamless interaction between first responders and public safety officials at Federal, State, and local level.

And I hope that the testimony today will provide some honest, objective clarity as to why we haven't done more to achieve progress in this area with all of the money that's already been made available.

Yes, there may be need for additional resources. I think first we need an honest accounting of how the money that has been made available for this purpose has been used, and why more hasn't been done with it.

Thank you, Mr. Chairman.

The CHAIRMAN. Could we now proceed with the statements?

Senator Dorgan, do you wish to make an opening statement?

**STATEMENT OF HON. BYRON L. DORGAN,  
U.S. SENATOR FROM NORTH DAKOTA**

Senator DORGAN. No, thank you. Not at this time.

The CHAIRMAN. Thank you very much.

Our first witness is Kenneth Moran.

Mr. Moran?

**STATEMENT OF KENNETH MORAN, ACTING DIRECTOR,  
OFFICE OF HOMELAND SECURITY, ENFORCEMENT BUREAU,  
FEDERAL COMMUNICATIONS COMMISSION**

Mr. MORAN. Good morning, Chairman Stevens and distinguished Members of the Committee.

My name is Ken Moran, and I serve as the Director of the Federal Communications Commission's Office of Homeland Security. I welcome this opportunity to discuss the ongoing efforts of the Commission to promote and facilitate effective public safety communication, as well as interoperability.

The Commission has taken several steps over the last few years to promote interoperability, which we define as radio communications between public safety agencies, usually of different jurisdic-

tions, in furtherance of both day-to-day and emergency operations. To further interoperability, the Commission has provided additional spectrum to public safety entities, we've promoted technological developments that enhance interoperability, and we have provided our expertise and input on a number of interagency efforts.

The Commission has designed approximately 97 MHz of spectrum for mobile public safety use throughout the country. This includes spectrum in the 150 MHz band, the 450, 700, 800 MHz bands, and the 4.9 GHz band.

The CHAIRMAN. We can't quite hear you. Can you pull that mike toward you a little bit?

Mr. MORAN. OK. Sorry, Senator.

In addition, the Commission has designated certain channels in these bands specifically for interoperability. Frequencies designated for interoperability include channels in the 150 MHz, 450 MHz, 700 MHz, and 800 MHz bands.

In addition, although not specifically designated for interoperability, the 4.9 GHz band rules foster interoperability by providing a regulatory framework where traditional public safety entities can pursue strategic partnerships with others, including critical infrastructure entities, as necessary for the completion of their missions. Also, once the 800-MHz transition is complete, public safety entities will also have access to another 4.5 MHz of spectrum in the 800 band.

The Commission also has developed policies and rules to promote the sharing of spectrum. For example, the Commission's rules permit the shared use of radio stations where licensees may share their facilities on a nonprofit, cost-shared—with other public safety organizations, including Federal Government entities.

In addition to facility interoperability on a regional basis, the Commission has reallocated television spectrum for public safety use in several cities. For example, the Commission recently reallocated spectrum in New York City.

The Commission has also modified its rules to eliminate regulatory barriers to help speed introduction of software-defined radio technology. Radios traditionally have been built with unalterable hardware components that perform specific functions. SDR technology allows radios to cover mobile frequency bands and signal formats by simply sending different software instructions to a microprocessor, instead of using additional frequently bulky and heavy parts. Because software-defined radios can use multiple frequency bands, including those designated for interoperability, they can be an important vehicle for improving interoperability for public safety communications systems.

Although this technology is not yet widely available for public safety use, we are aware, through the SDR forum, that public safety entities and industry are actively exploring these applications.

The Commission works with other Federal agencies in promoting public safety communications and interoperability. For example, the Commission has worked with the Department of Homeland Security's National Communication System and telecommunications providers to establish a regulatory framework that would facilitate wireless priority access service. Wireless priority services are espe-

cially important during major disasters and emergencies when wireless networks are often congested. Under the wireless priority active service rules, authorized national security and emergency preparedness personnel, such as first responders, may obtain access to the next-available wireless channels to originate calls.

The Commission has also been working closely with the Information Administration and the Department of Homeland Security's NCS and SAFECOM to pursue initiatives that would advance the common goal of improving public safety communications interoperability. As a result of this collaboration, Federal, State, and local governments have entered into strategic partnerships to plan, fund, and implement shared communications systems.

As directed by the Intelligence Reform and Terrorism Prevention Act of 2004, the Commission is conducting a study to assess the spectrum needs of emergency-response providers. As part of this study, the Commission, NTIA, and DHS have established a working group to facilitate the Commission's assessment of the short-term and long-term needs for allocation of additional portions of spectrum for Federal, State, and local emergency-response providers.

In light of recent events, we are also looking closely to determine what steps we can take to address this critical need. Recently, Chairman Martin announced his intention to create an independent expert panel to review the impact of Hurricane Katrina on the communications infrastructure. This panel will be composed of public safety and communications industry representatives, and will make recommendations to the Commission regarding ways to improve disaster preparedness, network reliability, and communications among first responders, such as police, fire, and emergency medical personnel. This panel will specifically be tasked with making recommendations regarding interoperability.

In closing, the Commission will continue to work with other Federal agencies in the public safety community to identify ways in which it can promote and facilitate enhanced interoperability.

I'd be happy to respond to your questions.

Thank you.

[The prepared statement of Mr. Moran follows:]

PREPARED STATEMENT OF KENNETH MORAN, ACTING DIRECTOR, OFFICE OF HOMELAND SECURITY, ENFORCEMENT BUREAU, FEDERAL COMMUNICATIONS COMMISSION

### **Introduction**

Mr. Chairman and members of the Subcommittee:

Good morning. I am Kenneth Moran, Acting Director of the Federal Communications Commission (Commission) Enforcement Bureau's Office of Homeland Security. I welcome this opportunity to appear before you to discuss the Emergency Alert System, or EAS.

The Commission is well aware that an effective public alert and warning system is an essential element of emergency preparedness, and that such a system is impossible without effective communication and coordination within the Federal Government, as well as with the active participation of the states and the private sector. Accordingly, the Commission has been working with other Federal agencies, state governments, and industry to ensure that the American public is provided with a robust, efficient, and technologically current alert and warning system.

### **Background**

The forerunner of our current Emergency Alert System originated in the early days of the Cold War when President Truman established the “CONELRAD” system as a means to warn the public of an imminent attack. Since that time, CONELRAD has given way to the Emergency Broadcast System, which in 1994 was replaced by EAS. From the early CONELRAD days to the present, the Commission has played a critical role in ensuring that the President of the United States would be able to communicate with the American public in the event of a national emergency. Today’s EAS uses analog radio and television broadcast stations, as well as wired and wireless cable systems, to deliver a national Presidential message. When activated, EAS would override all other broadcasts or cable transmissions, national and local, to deliver an audio Presidential message. This system is mandatory at the national level, but is also available on a voluntary basis for states and localities to deliver local emergency notifications.

The Commission, in conjunction with the Federal Emergency Management Agency (FEMA) and the National Weather Service (NWS), implements EAS at the Federal level. Our respective roles currently are based on a 1981 Memorandum of Understanding between FEMA, NWS, and the Commission, on a 1984 Executive Order, and on a 1995 Presidential Statement of Requirements.

The Commission’s EAS rules are focused on national activation, and the delivery of a Presidential message. The Commission’s rules prescribe: (1) technical standards for EAS; (2) procedures for radio and television broadcast stations and cable systems to follow in the event EAS is activated; and (3) EAS testing protocols. Under the rules, national activation of EAS for a Presidential message is designed to provide the President the capability to transmit from any location at any time within ten minutes of the system’s activation, and would take priority over any other message and preempt other messages in progress. Currently, only analog radio and television stations, and wired and wireless cable television systems, are required to implement the national EAS. Other systems, such as digital television (DTV), Direct Broadcast Satellite television (DBS), Low Earth Orbit (LEO) satellite systems, paging, Satellite Digital Audio Radio Service (SDARS), and In-Band-On-Channel Digital Audio Broadcasting (IBOC DAB) are currently not required to participate in EAS.

The decision to activate the national-level EAS rests solely with the President. FEMA acts as the White House’s executive agent for the development, operations, and maintenance of the national level EAS and is responsible for implementation of the national level activation of EAS, as well as EAS tests and exercises.

EAS is essentially a hierarchical distribution system. FEMA has designated 34 radio broadcast stations as Primary Entry Point (PEP) stations. At the request of the President, FEMA would distribute the “Presidential Level” messages to these PEP stations. The PEP stations are monitored in turn by other stations in the hierarchical chain. Commission rules require broadcast stations and cable systems to monitor at least two of the EAS sources for Presidential alerts that are specified in their state EAS plans. Initiation of an EAS message, whether at the national, state, or local level, is accomplished via dedicated EAS equipment. The EAS equipment provides a method for automatic interruption of regular programming and is capable of providing warnings in the primary language that is used by the station or cable system.

Along with its primary role as a national public warning system, EAS—and other emergency notification mechanisms—are part of an overall public alert and warning system, over which FEMA exercises jurisdiction. EAS use, as part of such a public warning system at the state and local levels, while encouraged, is voluntary. Nevertheless, the public receives most of its alert and warning information through the broadcasters’ and cable systems’ voluntary activations of the EAS system on behalf of state and local emergency managers.

### **Current Issues and the Commission’s Rulemaking Proceeding**

As noted above, the public relies heavily on EAS for emergency information. EAS therefore serves a critical purpose, but it currently only applies to analog radio and television stations, and wired and wireless cable television systems. In August 2004, the Commission began a rulemaking proceeding to review whether we need to either update EAS or replace it with a more comprehensive and effective warning system.

In initiating its rulemaking, the Commission encouraged commenters to consider recommendations from two public/private partnerships that have studied EAS issues extensively: the Media Security and Reliability Council (MSRC), an industry-led Federal Advisory Committee comprised of representatives from the radio, television, multi-channel video, public safety, and disabilities communities, and the Partnership for Public Warning (PPW), a not-for-profit, public/private partnership

that was incorporated with the goal of promoting and enhancing effective, integrated dissemination of public warnings.

The Commission has received comments from numerous interested individuals, Federal entities, state and local emergency planning organizations, and various sectors of the telecommunications industries. We have coordinated with DHS and its component, FEMA, and with the Department of Commerce and its component, the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service, and we will continue to do so.

The overarching question addressed in the proceeding is whether EAS in its present form is the most effective mechanism for warning the American public of an emergency, and, if not, how EAS can be improved. Most of the parties who commented agreed that our warning system should be improved. Most—including MSRC and PPW—also advocate upgrading, rather than replacing EAS, to take advantage of the existing EAS infrastructure.

The Commission's rulemaking proceeding addresses a number of specific and timely issues. For instance, the Commission noted that some parties argue that the purely voluntary nature of EAS at the state and local level results in an inconsistent application of EAS as an effective component of an overall public alert and warning system. To address these arguments, the Commission is examining whether permissive state and local EAS participation remains appropriate today, and whether uniform national guidelines should apply to state and local EAS implementation. Some parties who commented on this issue support continuing voluntary participation, at least for the present, while the Commission considers broader changes to EAS. Some parties also stated that participation, though voluntary, is widespread. These parties generally support continuing the voluntary nature of EAS.

The Commission's Notice of Proposed Rulemaking (NPRM) initiating the open proceeding focused on the fact that EAS is currently mandated only for analog television and radio, and for cable systems, which represent an increasingly smaller part of our information sources. The Commission is considering whether and how EAS obligations should be extended to services not currently covered—e.g., digital television and radio, and satellite radio and television. Many commenters support the Commission's efforts to extend the EAS rules to digital broadcasters.

The NPRM also asked questions about whether the technical capabilities of EAS can or should be applied to other communications platforms. Along with digital broadcast, new digital wireless technologies, including cellular telephony and personal digital assistants, are rapidly redefining the communications landscape, making available to the public warning technologies that are far more flexible and effective than the analog broadcast mechanism currently employed by EAS. The Commission is considering whether there should be an effort to use such technologies to form a comprehensive national public warning system capable of reaching virtually everyone all the time by combining EAS with alternative public alert and warning systems. We received a number of comments about methods, such as cell phone broadcasting, that could expand the reach of our warning systems in the future. In their comments, DHS and FEMA also noted that they are investigating new technologies for this purpose.

The Commission also is examining security and reliability issues relevant to EAS and on the important question of how best to supply an effective public warning system to the disabled community and non-English speakers. The Commission is also considering the role of various Federal Government departments and agencies, as well as local authorities, in implementing EAS.

In addition, the Commission is involved in other initiatives, beyond its rulemaking proceeding, to address the effectiveness of our Nation's warning systems. For instance, the Commission is participating in the Task Force on Effective Warnings Materials, a group of Federal departments and agencies that has been assembled to examine existing and planned disaster warning and communications systems, and to make recommendations to ensure that these systems are effective. We will continue to share our expertise and views, and to seek the expertise and views of others, on these important issues.

### **Conclusion**

The Commission looks forward to working with Congress, our colleagues at other Federal, State, and tribal agencies, and the public to ensure that we can provide an effective and technologically advanced warning system to our citizens. The Commission also is aware that the Congress is taking an active interest in the issue of public alert and warning, and stands ready to provide whatever technical assistance that the Congress would find helpful in this regard.

The CHAIRMAN. Thank you very much.

Dr. Boyd, we had you next. You're part of Homeland Security, also, aren't you?

Dr. BOYD. Yes, sir, I am.

The CHAIRMAN. Well, will you proceed, please?

**STATEMENT OF DAVID G. BOYD, PH.D., DIRECTOR,  
OFFICE FOR INTEROPERABILITY AND COMPATIBILITY,  
DEPARTMENT OF HOMELAND SECURITY**

Dr. BOYD. Good morning, and thank you, Mr. Chairman and Members of the Committee, for the invitation to speak to you today.

Interoperability requires, before all else, simple operability. As Hurricane Katrina demonstrated, in the absence of a reliable network across which responders within an agency can effectively communicate, interoperability is both irrelevant and impossible. Some seem to believe the introduction of new technologies alone can solve our interoperability problems. But adding equipment addresses only part of what a fully robust, reliable, and interoperable public safety communications system requires.

For example, when we lose towers, first responders have only their mobile or portable units available, so range is dramatically reduced, and control of the incident is severely compromised. Portable units permit some short-range communications, provided it's been planned and trained for, until the proprietary battery packs begin to fail and cannot be charged because the chargers are typically attached to the power grid. 9-1-1 centers are tied to the wired telephone networks, and so is the cellular system, which depends on cell phones that also use proprietary batteries. No single fix alone can address all these elements, and, more importantly, the planning and organizational elements.

Many solutions have been offered, and many claims have been made for each solution. But none is a silver bullet. Satellite phones are extremely useful for command elements, but often hopelessly impractical for individual first responders. They require training and signals can be blocked by vegetation, buildings, terrain, and even weather. They also use batteries that need recharging. And a first responder in the middle of a rescue or up to his armpits in water will find the antenna hard, or impossible, to aim.

Van or trailer-mounted communications systems dropped into the incident nearly always offer significantly less coverage than the original system, and may require significant training to use.

And all of these, without solid prior planning, will add to the difficulties of achieving interoperability once operability is achieved.

We believe what we've developed to support interoperability can also help first responders successfully navigate any communications emergency. We, in the public safety community, have identified six key building blocks required to achieve interoperability: governance, standard operating procedures, technology, training and exercises, routine use of interoperable systems, and cross-cutting all of these is the sixth, and probably most important element, a high degree of leadership, planning, and collaboration, with a commitment to an investment in sustainability.

To help public safety agencies, and especially the policy levels of government, understand the interrelationship of all of these fac-

tors, we developed a tool called the “interoperability continuum.” This planning tool explains how all these elements relate to each other, and makes clear all of these elements need to be addressed before, not during, an emergency.

Interoperability is not a new issue. It was a problem in Washington, D.C., when the Air Florida flight crashed into the Potomac in 1982; in New York City, when the Twin Towers were first attacked in 1993; in 1995 when the Murrah Building was destroyed in Oklahoma City; and in 1999, at Columbine. Too many public safety personnel cannot communicate by radio because their equipment is still incompatible or the frequencies they’re assigned are different. They operate on ten different frequency bands, among communications systems that are often proprietary and too often 30 or more years old. Over 90 percent of the Nation’s public safety wireless infrastructure is financed, owned, operated, and maintained by the more than 60,000 individual local jurisdictions—police, fire, and emergency medical services—that serve the public.

National efforts to fix the problem have historically been erratic, uncertain, and, until recently, uncoordinated. Worse, the efforts have too often been designed without the direct involvement of the people with the greatest stake in effective communications, the first responders themselves. The attacks on September 11, 2001, made clear this had to change.

Since September 11, significant progress has been made in interoperability, thanks to the priorities both the Administration and Congress have placed on it. In 2001, SAFECOM was established as a Presidential Management Initiative. In 2004, the Department established the Office for Interoperability and Compatibility to further strengthen and integrate interoperability and compatibility efforts. And in the Intelligence Reform Act, Congress gave it a legislative charter.

While fixing the Nation’s interoperability problems will require a sustained effort, we recognize that we cannot wait to move things forward. That’s why SAFECOM has initiated a number of near-term initiatives, including working with the National Institute of Standards and Technology to accelerate the development of standards, the interoperability continuum, and statewide planning tools: RapidCom, the program ably led by Dereck Orr of the NIST Office of Law Enforcement Standards while he was attached to my office, a public safety architectural framework, creation of a P-25 performance testing program, development of coordinated grant guidance across all Federal grant programs, creation of a national baseline, and identification of public safety spectrum needs. Mr. Orr will provide more detail on some of these.

This Nation is heavily invested in an existing infrastructure that is too often inadequate to the basic communications requirements of individual agencies and not interoperable.

We must continue to pursue a comprehensive strategy that takes into account technical and cultural issues associated with improving interoperability, which recognizes the challenges associated with incorporating legacy systems and practices in constantly changing technology and cultural environments and which encourages strong local leadership in ensuring that the needs of the front-line of emergency responders, the first responders, are met.

Though many challenges remain, we believe we've accomplished a great deal in the short time DHS has managed the program, but we believe a lot remains to be done.

[The prepared statement of Dr. Boyd follows:]

PREPARED STATEMENT OF DAVID G. BOYD, PH.D., DIRECTOR, OFFICE FOR  
INTEROPERABILITY AND COMPATIBILITY, DEPARTMENT OF HOMELAND SECURITY

**Introduction**

Good morning and thank you, Mr. Chairman and Members of the Committee, for the invitation to speak to you today.

Today's testimony will focus on SAFECOM, a communications program of the Office of Interoperability and Compatibility (OIC), which resides in the Office of Systems Engineering and Development, Science and Technology Directorate, Department of Homeland Security (DHS). SAFECOM provides development, testing, evaluation, guidance, research and assistance for local, tribal, state, and Federal public safety agencies working to improve public safety response through more effective and efficient interoperable wireless communications. (By public safety we mean fire, police, emergency medical services, emergency managers, and others who have emergency response missions). Although SAFECOM is working with practitioners to develop long-term strategic initiatives, without which the Nation will never solve the interoperability problem, we all know terrorists, natural disasters and other emergencies will not wait for a comprehensive national solution so the program has been designed with near-, mid- and long-term goals.

Communications interoperability refers to the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, as authorized. Unfortunately, the Nation is heavily invested in an existing infrastructure made up largely of systems that are too often incompatible. To change this, efforts within the Federal Government to address the interoperability problem are being coordinated by SAFECOM and incorporate the needs of local, state, and Federal practitioners. But there are no immediate, silver bullet fixes to the financial, technical and cultural challenges that face us. As the Government Accountability Office (GAO) acknowledged in a July 2004 report, communications interoperability is a long-term problem with no one-size-fits-all solution.

**Public Safety Communications Environment**

Interoperability is not a new issue; it has plagued the public safety community for decades. It was a problem in Washington, D.C., when the Air Florida flight crashed into the Potomac in 1982. It was a problem in New York City when the Twin Towers were first attacked in 1993. It was a problem in 1995 when the Murrah Building was destroyed in Oklahoma City, and in 1999 at Columbine. The reality is that today, too many public safety personnel cannot communicate by radio with personnel from other agencies or disciplines because their equipment is still incompatible, or the frequencies they are assigned are different. They operate on 10 different frequency bands and run communications systems that are often proprietary, and that are too often 30 or more years old, in an era when the technology lifecycle is only 18 to 24 months. Over 90 percent of the Nation's public safety wireless infrastructure is financed, owned, operated, and maintained by the more than 60,000 local jurisdictions that provide emergency services to the public and only a very tiny fraction of this funding is Federal. National efforts to fix the problem have historically been erratic, uncertain, and until recently, uncoordinated. The attacks on September 11, 2001, made clear this had to change.

Since September 11, 2001, significant progress has been made to improve communications interoperability for the public safety community. Yet it is apparent that more must be achieved. Much of this progress can be attributed to the priority that both the Administration and Congress have placed on solving the problem of communications interoperability. In 2001, SAFECOM was established as a Presidential Management Initiative and charged with strengthening interoperability at all levels of government by coordinating Federal programs, initiating a comprehensive standards program, and developing a national architecture. In 2004, the Department established OIC to further strengthen and integrate interoperability and compatibility efforts to improve local, tribal, state, and Federal public safety preparedness and response. OIC was directed to:

- Identify and certify all DHS programs that touch on interoperability;
- Support the creation of interoperability standards;

- Establish a comprehensive research, development, testing, and evaluation (RDT&E) program for improving public safety interoperability;
- Integrate coordinated grant guidance across all DHS grant making agencies that touch on public safety interoperability;
- Oversee the development and implementation of technical assistance for public safety interoperability;
- Conduct pilot demonstrations;
- Create an interagency interoperability coordination council; and
- Establish an effective outreach program.

#### **Long-Term Vision**

Practitioners helped SAFECOM articulate a long term vision for interoperability which projects that, not later than 2023, first responders will operate on a national system-of-systems using standards-based equipment that provides the capability to respond to an incident anywhere in the country, using their own equipment, on any network, and on dedicated public safety spectrum. They will be able to communicate with each other as authorized via voice, data, and video on demand and in real time. Making this vision flesh will require work in five critical success areas, including:

1. A common set of guidelines and criteria for public safety communications systems in conjunction with a national architecture framework;
2. Coordinated testing and evaluation processes to ensure communications equipment meets critical requirements;
3. Standardization of equipment fortified by interim grant guidance measures;
4. Coordinated spectrum policy that meets the needs of the public safety community; and
5. Certification of state communications plans.

None of these initiatives will be accomplished overnight, but many of them are already beginning to strengthen interoperability in the public safety community.

#### **Near-Term Initiatives**

While fixing the Nation's interoperability problem will require a sustained effort, we recognize that we must quickly ensure sufficient interoperability at all levels of government to meet emergencies of any kind. To do this, DHS and SAFECOM has initiated a number of near-term initiatives, including development of the Interoperability Continuum, development of statewide planning tools, execution of the RapidCom Initiative, publication of a national statement of requirements, creation of a conformance testing program, development of coordinated grant guidance for inclusion in every Federal grant program, creation of a national baseline, identification of public safety spectrum needs, development of emergency response plans for immediate communications capabilities, and coordination with Office of State and Local Government Coordination and Preparedness' (SLGCP) Interoperable Communications Technical Assistance Program (ICTAP).

#### *Statement of Requirements and a National Architecture Framework*

Interoperability plans to support responses to an incident need to be developed based on a common set of guidelines and criteria for public safety communications systems and these should be aligned with a national architecture framework. Only when these guidelines are universally recognized and followed will first responders and the larger public safety community be able to communicate effectively. To that end, SAFECOM published Version 1.0 of the first ever comprehensive Public Safety Statement of Requirements for Communications and Interoperability (SoR). Developed with public safety practitioner input, the SoR defines the functional requirements for public safety communications. Subsequent versions will further refine these technical requirements so that industry will have a blueprint to which to build technologies that address public safety's needs. This SoR also serves as the basis for developing a national architecture framework for communications interoperability. SAFECOM is working to develop a Public Safety Architecture Framework (PSAF) that, with the SoR, will serve as a tool to help the Nation's first responder agencies understand the technical requirements and national migration path toward fully interoperable communications systems without imposing requirements that stifle innovation.

*Coordinated Testing and Evaluation of Equipment*

The next step in achieving national communications interoperability is the development of coordinated testing and evaluation processes to ensure communications equipment meets the critical needs of first responders. Public safety is faced with many complex procurement decisions and frequently has to hope that the equipment they buy will do what it claims. To ensure that public safety is able to truly trust the claims made by vendors, communications equipment needs to be tested and evaluated based on first responder needs and capabilities. To do this, SAFECOM created a testing and evaluation working group to help ensure that methodologies for testing and evaluation of interoperability products are technically sound and comparable across testing laboratories. The working group members are practitioners and subject matter experts from law enforcement, fire services, and emergency medical services. These members help review and develop test criteria and serve the program by determining which products should be evaluated.

*Standardization of Equipment Fortified by Interim Grant Guidance*

Standardization of equipment fortified by interim grant guidance measures is an essential step in achieving communications interoperability. The equipment must adhere to communications standards that allow for improved interoperability. As standards are created, funding solutions must also be implemented to help jurisdictions meet interoperability goals and requirements. To better coordinate the funding of interoperability solutions, such as purchasing new equipment, developing state plans, or other activities, we resolved a major hurdle in achieving interoperability: conflicting Federal grant guidance. In the past, Federal grant programs for public safety communications were not coordinated and too often resulted in the use of limited Federal resources to create systems that made interoperability even more difficult to achieve.

Our coordinated grant guidance outlines eligibility for grants, the purposes for which grants can be used, and guidelines for implementing a wireless communications system in order to help maximize the efficiency with which public safety communications related grant dollars are allocated and spent. To ensure consistency in interoperability grant solicitations, this guidance has been included in grant programs administered by the Department of Justice and other agencies within DHS. Within DHS, the Office for State and Local Government Coordination and Preparedness (SLGCP) reports that it has provided more than \$1.5 billion in direct funding to local jurisdictions, urban areas, and states. SLGCP has three primary grant programs that have incorporated SAFECOM's grant guidance on issues regarding communications interoperability. These programs are the State Homeland Security Grant Program, Urban Areas Security Initiative Grant Program, and the Law Enforcement Terrorism Prevention Grant Program. Many of the system procurements and enhancements supported by this funding are still being implemented. More thorough monitoring of these projects is required to ascertain whether they achieve their intended goals.

It is important to note, however, that although SAFECOM has developed consensus guidance and tools to improve the grant making process, the program does not directly manage or provide funding to local or state agencies for communications projects. Grant guidance is an important step toward improving national interoperability because it helps to align public safety communications related grant dollars with the national effort to improve interoperability at all levels of government.

OMB also requires all Federal agencies demonstrate their programs are fully aligned with SAFECOM guidance in developing their own communications plans.

*National Baseline of Public Safety Communications*

The National Interoperability Baseline study will provide the Nation's first statistically significant, quantitative measurement of the current state of public safety communications interoperability. The development of the survey methodology was initiated in January 2005 and the resulting study will provide an understanding of the current state of interoperability nationwide upon completion. Additionally, it will serve as a tool to measure future improvements made through local, state, and Federal public safety communications initiatives.

The survey instrument developed for Interoperability Baseline will allow SAFECOM to identify areas with interoperability shortfalls, track the impact of Federal programs and measure the success of these programs, establish an ongoing process and mechanism to measure the state of interoperability on a recurring basis, and develop an interoperability baseline self-assessment tool for local and state public safety agencies.

*Coordinated Spectrum Policy That Meets the Needs of Public Safety*

Radio spectrum is a finite resource—there is only so much available and it is shared by public safety, radio broadcasters, government users, and other commercial and private consumers. The large demand for this resource can lead to overcrowding, which, in turn can cause delays in or disruption of communication for public safety. The Federal Communications Commission has allocated certain frequencies to public safety, but these allocations are fragmented, creating challenges for communications among different agencies and jurisdictions. In the Intelligence Reform and Terrorism Prevention Act of 2004, Congress required the Federal Communications Commission (FCC) in consultation with DHS and the National Telecommunications and Information Administration (NTIA) to conduct a study to assess the spectrum needs for local, state, and Federal first responders, which is due in December 2005. SAFECOM is currently assessing public safety spectrum needs in support of the President's national spectrum management initiative. DHS, in consultation with the Department of Commerce and other relevant agencies, is developing a Spectrum Needs Plan out of these assessments which will be delivered to the President by the end of November 2005.

*Certification of State Communications Plans*

Interoperability requires, before all else, simple operability—that is, communications within the local agency. As Hurricane Katrina demonstrated, in the absence of a reliable network across which responders within an agency can effectively communicate, interoperability is both irrelevant and impossible. Strengthening and ensuring basic level public safety communications capabilities, therefore, is the first task. But progressing from agency-specific operability towards multi-jurisdictional and multi-disciplinary interoperability requires attention to more than technology.

Some believe the introduction of new technologies alone can solve our interoperability problems. But adding equipment addresses only one part of what a fully robust, reliable, and interoperable public safety communications system requires. With input from the public safety community, we have identified five key building blocks required to achieve interoperability. Governance, Standard Operating Procedures (SOP), Technology, Training and Exercises, routine use (Usage) of interoperable systems, and regular Maintenance must all be present for interoperability to be possible. To help public safety agencies and especially the policy levels of government understand the interrelationship of all of these factors, we developed a tool called the “Interoperability Continuum.” This planning tool explains how all these elements relate to each other. For example, if a city within a region procures new equipment it may have a technical interoperability capability, but unless it has also conducted exercises to test procedures (and find points of failure) and concepts of operation, and developed policies agreeable to the entire region, it is unlikely the new equipment can be effectively integrated into regional interoperability plans. As states develop their emergency communications plans, we recommend that they address all the elements of the Interoperability Continuum.

*Statewide Planning Tools*

Statewide communications plans are often unsuccessful because the top-down approach fails to consider the requirements of the first responders who are the primary users and who control the most of the wireless infrastructure.

In 2004, SAFECOM partnered with the Commonwealth of Virginia and the Department of Justice to develop a strategic plan for improving statewide interoperable communications for the state. The effort was based on SAFECOM's “bottom-up,” locally-driven approach. The planning process included six regional focus group sessions, which culminated in a final strategic planning session. The focus group sessions captured perspectives from numerous local public safety representatives throughout the Commonwealth; these perspectives were used in the final strategic planning session in which recommendations for key initiatives were developed as part of a statewide strategic plan for improving public safety communications and interoperability.

Based on lessons learned from the Virginia planning process, SAFECOM published the Statewide Communications Interoperability Planning (SCIP) Methodology as a model for integrating practitioner input into a successful statewide strategic plan to every state. The SCIP Methodology serves as one approach for states to consider as they initiate statewide communications planning efforts.

We are also implementing Section 7304 of the Intelligence Reform and Terrorism Prevention Act of 2004 (Public Law 108-458), which authorized the Secretary of Homeland Security to carry out at least two Regional Communications Interoperability Pilots (RCIP). In accordance with the Congressional criteria for determining the location of the pilot sites, as well as criteria outlined by the program itself,

SAFECOM selected the State of Nevada and the Commonwealth of Kentucky as RCIP locations. SAFECOM, in coordination with the Office of State and Local Government Coordination and Preparedness' Interoperable Communications Technical Assistance Program (ICTAP), is helping both states implement the SCIP methodology.

Building on lessons learned from the SCIP Methodology and earlier SAFECOM initiatives, the RCIP projects will help us identify models for improving communications and interoperability that take into account the wide range of challenges across the nation. When the projects are complete, Nevada and Kentucky will each have improved interoperability plans and we will be able to use the lessons learned to better develop or strengthen replicable tools and methodologies which will be made available to public safety practitioners, as well as to local and state governments. An interim report regarding the progress of the pilot projects has been submitted to Congress. A final report will be provided to Congress in June 2006.

We believe statewide emergency communications plans are fundamental to an effective response to a catastrophic event. As states continue to develop their own plans, SAFECOM recommends that they do so in coordination with SAFECOM methodologies and guidance.

#### *RapidCom*

On July 22, 2004, President Bush formally announced the RapidCom initiative, a program designed to ensure that a minimum level of public safety interoperability would be in place in ten high-threat urban areas by September 30, 2004.

In coordination with the Office of State and Local Government Coordination and Preparedness (OSLGCP), the Department of Justice's 25 Cities Program, and the DHS Wireless Management Office, SAFECOM worked closely with public safety leaders in ten high-risk urban areas centered in Boston, Chicago, Houston, Jersey City, Los Angeles, Miami, New York, Philadelphia, San Francisco, and the Washington Metropolitan Area to assess their communications interoperability capacity and needs, and to identify and implement solutions. In keeping with the SAFECOM "bottom-up" approach, local officials drove the design and implementation of solutions in their jurisdictions.

With the on-time completion of the RapidCom project, incident commanders in each of the urban areas now have confirmed they have the ability to adequately communicate with each other and their respective command centers within one hour of an incident.

#### *Interoperable Communications Technical Assistance Program (ICTAP)*

A key component in achieving interoperable communications across the Nation is providing on-site technical assistance to states and urban areas. SLGCP funds ICTAP, a technical assistance program designed to enhance interoperable communications between local, state, and Federal first responders and public safety officials. The program provides free support to states and urban areas with the goal of enabling local public safety officials to communicate across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, as authorized.

#### **Conclusion**

These initiatives are only part of what the SAFECOM program has undertaken to advance communications interoperability across the Nation. This Nation is heavily invested in an existing infrastructure that is too often inadequate to the basic communications requirements of individual agencies and not interoperable. We must continue to pursue a comprehensive strategy that takes into account technical and cultural issues associated with improving interoperability, which recognizes the challenges associated with incorporating legacy equipment and practices in constantly changing technology and cultural environments, and which ensures that the needs of the frontline of emergency response—the first responders—are met. Though many challenges remain, we believe we have accomplished a great deal in the short time DHS has managed this program.

We are confident that with your continuing support and the assistance of our many Federal partners, we will continue to move towards a world where lives and property are never lost because public safety agencies are unable to communicate or lack compatible equipment and training resources.

#### APPENDIX I: OIC AUTHORITIES FROM THE INTELLIGENCE REFORM AND TERRORISM PREVENTION ACT OF 2004

Congress, with the passage of the Intelligence Reform and Terrorism Prevention Act of 2004 (Pub. L. 108-458) less than a year ago, gave OIC and SAFECOM legis-

lative authority to carry out its responsibilities. Before passage of this Act, responsibility for addressing interoperability was spread across three different agencies. Section 7303 of the Act directed SAFECOM to:

- coordinate with other Federal agencies to establish a comprehensive national approach to achieving public safety interoperable communications;
- develop, with Federal agencies and state and local authorities, minimum capabilities for communications interoperability for Federal, state, and local public safety agencies;
- accelerate voluntary consensus standards for public safety interoperable communications;
- develop and implement flexible open architectures for short- and long-term solutions to public safety interoperable communications;
- identify priorities for research, development, and testing and evaluation within DHS and assist other Federal agencies in doing the same with regard to public safety interoperable communications;
- provide technical assistance to state and localities regarding planning, acquisition strategies, and other functions necessary to achieve public safety communications interoperability;
- develop and disseminate best practices to improve public safety communications interoperability;
- develop appropriate performance measures and milestones to measure the Nation's progress to achieving public safety communications interoperability;
- provide technical guidance, training, and other assistance to support the rapid establishment of consistent, secure, and effective interoperable communications capabilities in the event of an emergency in urban and other areas determined by the Secretary to be at consistently high levels of risk from terrorist attack; and
- develop minimum interoperable communications capabilities for emergency response providers.

#### APPENDIX II: TOOLS AND METHODS BASED ON LOCAL AND STATE PILOTS

*Communications Tabletop Exercise Methodology*, a process for a communications-focused tabletop exercise replicable across urban areas.

*Tabletop Exercise After-Action Report*, a template for capturing key findings and identifying gaps following each tabletop exercise.

*Interoperability Pocket Guide*, a process for creating an area-specific interoperability pocket guide to ensure local public safety officials are aware of current capabilities available in their areas.

*Templates for Improving Interoperability*, including governance charter, standard operating procedure (SOP), and memorandum of agreement (MOA) templates to help communities improve interoperability.

*Operational Guide for the Interoperability Continuum—Lessons Learned from RapidCom*, which outlines the importance of each element of the Interoperability Continuum, provides common challenges to consider when working towards improved interoperability, and recommends key actions to increase an area's capabilities.

The CHAIRMAN. Thank you very much.

Chief Carter, Association of Public-Safety Communications Officials International, and Chief of Communications, Shreveport, Louisiana, Fire Department. Thank you for coming.

**STATEMENT OF WILLIS CARTER, FIRST VICE PRESIDENT,  
ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS  
OFFICIALS, INTERNATIONAL (APCO); CHIEF OF  
COMMUNICATIONS, SHREVEPORT FIRE DEPARTMENT**

Mr. CARTER. Thank you, Chairman Stevens and Members of the Committee, for the opportunity to appear before you here today.

My name is Willis Carter. I'm the First Vice President of APCO, the Association of Public-Safety Communications Officials. I'm also Chief of Communications for the Shreveport, Louisiana, Fire De-

partment. In addition to appearing on behalf of APCO, I note that the following national organizations have indicated their support for my testimony here today: The International Association of Chiefs of Police, the International Association of Fire Chiefs, the National Association of Counties, the National Leagues of Cities, and the Congressional Fire Services Institute.

We are very pleased that Congress is considering how it can promote public safety communications. Recent events have demonstrated the importance of incident command and control, which obviously requires effective and efficient communications. We want to emphasize that communications solutions need to focus not only on major disasters, such as Katrina and 9/11, but also on the day-to-day communications requirements of public safety agencies. We must also work to identify the real problems and develop carefully planned approaches to solve those problems. This is no time to throw money at ill-conceived Band-Aid solutions. We also caution that solutions not be thrust upon state and local governments without consideration of cost.

There are three broad areas where assistance is needed. First, planning, coordination, and training. Second, sufficient radio spectrum for robust interoperable radio communications. And third, funding to help state and local government agencies acquire the skills and the equipment they need to provide the best-possible communications capability.

My hometown of Shreveport, which is in northwest Louisiana, escaped the wrath of Katrina. However, this past weekend, we did have serious wind damage and extensive power outages, thanks to Hurricane Rita. Throughout both hurricanes, our communications system, which has interoperability with some 50 agencies, worked extremely well. Of course, other areas in the Gulf Coast region saw much more devastation and experienced more serious communications problems.

Shortly after Hurricane Katrina, I had the opportunity to go on a fact-finding mission to many of the affected areas. And this is more fully described in my written statement. I saw devastation and despair in every direction. I also saw the same basic problems in all areas: lack of coordinated incident command, lack of direct support for communications centers and their personnel, and the inability to communicate.

The damage caused by Hurricane Katrina either destroyed or seriously damaged many public safety communications facilities. Typically, public safety systems are designed to withstand the worst that nature or man can offer. And it's very unusual for public safety systems to fail, even after commercial systems go down. Katrina was a real exception to that. Nevertheless, Katrina is a warning that public safety systems need to take all reasonable steps to ensure survivability.

A lack of interoperability was a major problem both during and following Katrina. However, the breakdown of basic operability was also a serious concern. First responders could not communicate, in many cases, with their own agencies, let alone personnel from other jurisdictions.

Maintaining operability and achieving interoperability are complex tasks, with no single answer for all public safety agencies or

regions. Possible solutions to this problem can include better training—better planning and training, compatible radio equipment, patches to tie radio networks together, radio systems that operate in the same radio frequency band, more spectrum for interoperability channels, and, in some cases, all of the above.

One of the most important steps that Congress can take is to establish an early and firm date for the clearing of TV stations from the 700 MHz band. That, in turn, will free up spectrum which was allocated for public safety use back in 1998.

My written statement spells out some of the benefits of this spectrum. However, to summarize, the spectrum will help to alleviate serious congestion on many existing public safety radio systems. It will provide capacity for new communications tools. And it will promote enhanced interoperability, both on a daily basis and during major emergencies.

Congress can also assist by providing funding to support training, planning, and coordination. Funding is also needed to enhance communications system survivability, and help state and local governments acquire new equipment for robust interoperable communications systems.

Mr. Chairman, just as September 11, 2001 helped us to focus the Nation on the communications issues facing our first responders, Hurricane Katrina has revealed that much still needs to be accomplished in order to provide the public safety personnel with the tools that they need to protect the safety of life and property. We look forward to working with the Congress and other parties toward this crucial effort.

Thank you, once again, for the opportunity to appear before you today.

[The prepared statement of Mr. Carter follows:]

PREPARED STATEMENT OF WILLIS CARTER, FIRST VICE PRESIDENT, ASSOCIATION OF PUBLIC-SAFETY COMMUNICATIONS OFFICIALS, INTERNATIONAL (APCO); CHIEF OF COMMUNICATIONS, SHREVEPORT FIRE DEPARTMENT

Thank you Chairman Stevens, Co-Chairman Inouye, and Members of the Committee for the opportunity to appear before you today, and for your long-standing interest in the communications issues facing our Nation's first responders.

My name is Willis Carter and I am the First Vice President of APCO International, the Association of Public-Safety Communications Officials. I am also Chief of Communications for the Shreveport, Louisiana Fire Department. I have served a total of 34 years with the Department, the last 20 of which have been in my current position. In addition to appearing on behalf of APCO International, I note that the following national organizations have indicated their support for my testimony here today and have requested that their support be noted in the record: International Association of Chiefs of Police, International Association of Fire Chiefs, National Association of Counties, National Leagues of Cities, and the Congressional Fire Services Institute.

APCO International is the Nation's oldest and largest public safety communications organization, with over 14,000 individual members who manage and operate communications systems and facilities for police, fire, emergency medical and other state and local government public safety agencies.

APCO International has been very active in helping to respond to Hurricane Katrina and its aftermath. We have been working closely with the public safety agencies in the affected areas, first, to provide whatever assistance we can to the individuals and agencies involved, and second, to gather information so that we may learn from this disaster and be better prepared in the future. Through a variety of mechanisms, our members from across the Nation have also been coming to the aid of their colleagues in the hardest hit areas, providing both professional and personal assistance whenever possible.

Through its role as a FCC-certified frequency coordinator, APCO International has helped to secure radio communications frequencies for emergency response agencies in the affected areas, and to assist agencies that must repair or replace damaged facilities. I note that APCO International has done so while waiving its normal frequency coordination fees.

Fortunately, my hometown of Shreveport, which is in northwest Louisiana, escaped the wrath of Katrina. We were not so lucky with Hurricane Rita, which did cause some damage and significant power outages in the Shreveport area. I am pleased to report that our public safety communications system in Shreveport worked very well after both of the recent hurricanes. However, as we all know, there were serious communications problems in many of the areas that were more directly affected by Hurricane Katrina.

Shortly after Katrina struck, I had the opportunity to go on a fact-finding mission to many of the affected areas. I have also had extensive communication with my colleagues from other public safety agencies throughout Louisiana. My statement today will summarize some of my observations, offer other information that APCO International has gathered, and present some general concerns that APCO International has as we move forward to improve public safety communications capabilities. I want to emphasize that our solutions need to focus not just on major disasters, such as Hurricane Katrina and 9/11, but also on the day-to-day communications requirements of public safety agencies. We must also work to identify the real problems and develop carefully planned approaches to solve those problems. This is no time to throw money at ill-conceived "band-aid" solutions. I also caution that solutions not be thrust upon state and local governments without consideration of cost.

On Monday September 5, I traveled to St. Tammany Parish, which is located on the north side of Lake Pontchartrain. There I toured seven dispatch centers. The devastation that I witnessed was unimaginable. Public safety call takers and dispatchers operating at Public Safety Answering Points, or PSAPs, were working and living in their communications centers. Some had lost their homes, and most had suffered significant damage, but all were on the job and still attempting to provide help and assistance to the thousands of citizens in need. Communications capabilities were at best very limited. The primary tower site which supports the City of Slidell radio system had been damaged, but was still affording limited service. The entire area of Slidell, Louisiana was without power and relying on emergency backup power sources. The Covington area had some power restored. 9-1-1 was totally out of service.

I departed St. Tammany Parish on Tuesday, and traveled to St. Charles Parish, which is adjacent to Jefferson Parish and on the west side of New Orleans proper. This area did not endure the direct blunt of the storm, and although sustaining somewhat less damage than what I had seen the day before, they were nonetheless facing significant challenges with limited radio communications, and a total outage of 9-1-1. I was to find that the worst was yet to come. The Jefferson Parish Communications Center was in much more dire circumstances. Communication to field units was very limited, access to 9-1-1 was completely out, and the call takers and dispatchers were experiencing the impact of the stress of working, sleeping, and eating in their dispatch center since the storm hit five days earlier. The Fire Dispatch Commander told me that he had lost five dispatch personnel since the storm due to the fact that the stress associated with this tragic event had prompted them to simply walk out. My attempts to reach the New Orleans Police dispatch center and the New Orleans Fire dispatch center were unsuccessful. Flooding prevented access to either of these centers which had both been evacuated. There was no 9-1-1 service, and the majority of public safety radio communications were not functioning.

As has been reported elsewhere, a major communications problem occurred when the New Orleans 800 MHz radio system went down, and repairs were delayed for several days. My understanding is that the system would normally have provided a mutual aid backbone for surrounding jurisdictions and linkage to the Louisiana state radio system (which also suffered some damage in the area). Aside from the impact of the New Orleans radio system, the relief efforts were plagued in many areas by a lack of interoperability between radio equipment used by various first responders.

My department in Shreveport operates on an 800 MHz system that services all police, fire, EMS and other agencies in Caddo Parish, and provides good interoperability on a daily basis within the region. However, when members of my department were detailed to the New Orleans area, they were unable to operate our radios on the Louisiana State 800 MHz network due to software incompatibility. This problem can be fixed, for about \$800 per radio, but requires funding from State or Federal sources.

Another problem that I was told about involved a local agency in the New Orleans area that actually disconnected equipment designed to patch its system with another in the area, as they were fearful of system overloads.

In all, I visited four parishes and had the opportunity to visit a total of nine communications centers. I saw devastation and despair in every direction, and I also saw the same basic problems in all areas. Lack of coordinated incident command and control, lack of direct support for communications centers and their personnel, and the inability to communicate were obvious problems in every area that I visited.

There were several factors that contributed to the public safety communications outages in all of these areas. The damage caused by the hurricane winds either destroyed or seriously damaged many primary tower and transmitter sites. The ensuing power outage which engulfed the area required the use of emergency power generators, many of which had been damaged or destroyed by flying debris and rising water. Many of those that remained in operation were faced with exhausted fuel supply either by disruption of natural gas supply lines, or the fact that there was no way to get diesel fuel into them as the result of flooding. Some communications sites were simply swallowed up by the floodwaters. Bell South central offices, which served as 9-1-1 tandems, were flooded, which created outages of 9-1-1 service in as many as 13 parishes.

My experiences in the affected areas reflect just some of the communications problems that became evident in the wake of Katrina. Based upon what we know of those problems, and of our knowledge of emergency communications needs in general, we would like to offer the following recommendations:

- Significant improvements in local, regional, and national interoperability are essential.

As noted above, interoperability was a major issue in the response to Katrina, just as it was in responses to other major emergencies, and as it is on a daily basis across the Nation. Note, however, that for Katrina, interoperability problems were masked to some degree by the larger and in many ways more serious breakdown of "operability" that occurred due to the destruction of facilities or power outages. First responders could not communicate in many cases within their own agencies, let alone with personnel from other jurisdictions.

It is also important to understand that achieving interoperability is complex, without simple solutions. Sometimes the need is for better planning and training; sometimes the need is for compatible radio equipment; sometimes the need is for "patches" to tie together radio networks; sometimes the need is for radio systems to operate in the same radio frequency band; sometimes the need is for more spectrum for interoperability channels; and sometimes it is all of the above.

There also needs to be a recognition that there are different types of interoperability: for day-to-day local and "regional" incidents that require multi-agency responses, and for major emergencies (such as Katrina) where emergency responders may be from far and wide. The specific solutions vary, and must be carefully planned and tailored to each situation. As discussed below, one key element of the "solution" is the nationwide clearing of the 700 MHz band.

In his testimony last week, FCC Chairman Martin mentioned the potential for "smart" radios that can operate on different frequency bands. We agree that such technology should be encouraged as part of the long-term solution for interoperability. However, we caution that such technology, at least for portable units, is still in development, and probably a long way from being available at affordable costs. For the foreseeable future, we need interoperability solutions that take into consideration the enormous imbedded base of public safety equipment, currently available technologies, and the limited budgets of state and local governments.

Finally, on the interoperability issue, I want to note our strong support for the DHS SAFECOM Program. SAFECOM is doing very important and useful work to address interoperability, and it deserves the continued support of Congress. Importantly, SAFECOM has incorporated state and local government organizations and public safety practitioners into the process, rather than relying on a top-down approach that ignores the real-life needs and concerns of first responders.

- Planning and training for disasters are essential, and plans need to be properly executed when disasters strike.

Katrina and its aftermath showed us once again that disaster response efforts, including communications capabilities, must be planned well in advance. Equally important, relevant personnel need to be trained and prepared to implement disaster plans. Funding needs to be made available specifically for such planning and training.

- There must be common incident command structures at all levels of the emergency response effort.

I saw firsthand the widely-reported breakdowns in emergency response command structures. Tragically, far too many personnel who were ready and equipped to lend assistance were left without adequate direction, communication, or information.

- Funding must be available to ensure that public safety communications networks are built and maintained to withstand worse-case scenarios. Plans and funds must also be in place to restore facilities that, despite best efforts, are disrupted.

Typically, public safety systems are designed to withstand the worst that nature or man can offer, and it is very unusual for public safety systems to fail, even after commercial communications networks go down. Katrina was a rare exception. At present, we do not know the degree to which the system outages caused by Katrina could have been avoided. Nevertheless, Katrina is a warning that public safety systems need to take all reasonable steps to ensure survivability. That will require funding and other assistance from Federal, State, and local governments.

Last week's hearing also included discussion of using satellite technology in emergency relief efforts when existing networks fail. We agree that satellites can and should be *part* of the solution, especially as alternative means of interconnecting to the national telephone network. However, we do not see satellite service as a *replacement* for terrestrial mobile radio networks. Satellite phones are limited by power issues and, more importantly, generally do not work inside of buildings.

- There must be a "hard date" for nationwide public safety access to the 700 MHz band, which is now blocked in many areas by analog television stations.

An early "hard date," as close to the end of 2006 as possible, is essential for public safety agencies to be able to plan for and fund new radio systems using the 700 MHz band. Portions of that spectrum were allocated for public safety in 1998, but remain blocked by incumbent television stations. Mr. Chairman, this committee has already spent considerable time on this issue and the related transition to digital television. However, I would like to take this opportunity to emphasize briefly why this spectrum is so important for public safety.

The public safety spectrum in the 700 MHz band would help to alleviate serious congestion on many existing public safety radio systems, especially in major metropolitan areas. Many current public safety systems operate with too few channels and insufficient capacity. That congestion can endanger the lives of first responders and the public, and it prevents deployment of new communications tools.

The 700 MHz band will also facilitate interoperability, both on a daily basis and for major emergencies. The band is adjacent to the existing 800 MHz public safety band, and will allow for relatively easy interoperability between the two bands (700/800 MHz equipment is already available in the marketplace). The new public safety spectrum will also allow for new and expanded multi-agency, multi-jurisdictional radio systems, which is perhaps the best long-term solution for interoperability. Finally, the FCC rules set aside 2.6 MHz of spectrum within the 700 MHz band for dedicated national interoperability channels, with a requirement that all 700 MHz radio equipment be programmed to operate on these channels pursuant to a digital interoperability standard.

Once the Congress fixes a hard date, agencies will be able to move forward to plan, fund and construct radio systems in the 700 MHz band. The FCC has already established rules for the new spectrum, state governments have already received state-wide licenses, some equipment is already available (and other equipment will be, once manufacturers have the certainty needed to justify R&D), and regional planning is well underway. For some existing 800 MHz systems, the 700 MHz channels will also provide opportunities for rapid expansion without the need to build new systems.

As a footnote, Louisiana is exploring whether 700 MHz channels and equipment could be a key element of a new radio system for the area. Fortunately, the 700 MHz public safety channels are not blocked by TV stations in Louisiana. The same cannot be said for most metropolitan areas of the country.

- There is a need for additional 700 MHz band spectrum for mobile broadband operations to provide high speed video and data to and among public safety personnel and agencies in the field.

Last year, Congress instructed DHS and the FCC to study this issue, and a report is due in December.

- Additional funding is needed to assist public safety agencies in their acquisition of state-of-the-art interoperable communications equipment.

Many agencies need assistance to implement both short-term and long-term interoperable solutions. One small example is the software upgrades needed for my department's radios to operate on the state-wide radio network. Funding should also include training and staffing.

- PSAPs and other emergency communications centers must be considered as core elements of the first response structure, and the staff of those facilities needs the support of all levels of government.

Much attention has properly been focused on the brave first responders on the streets of the affected areas, who have worked hard to save lives and address the turmoil and destruction created by Hurricane Katrina. Unfortunately, not enough attention has been placed on the equally brave and committed personnel who receive 9-1-1 calls, dispatch emergency personnel, and manage communications centers under enormous pressures. They too need our support.

- Telephone central offices supporting 9-1-1 tandems must be "mirrored" in locations sufficiently remote to allow for quick restoration of 9-1-1 services.

As I noted above, as many as thirteen PSAPs may have been disrupted largely because the relevant Bell South central stations were flooded.

- Congress should provide funds to assist PSAPs in their upgrades for wireless E9-1-1 and other technologies.

We urge Congress to go beyond merely funding a program office. Significant and meaningful grant funds should also be made available. We also note that suggestions that PSAPs move towards IP-based technologies often ignore the huge cost that would be imposed upon cash-strapped state and local governments.

Mr. Chairman, just as September 11, 2001, helped to focus the Nation on the communications issues facing our first responders, Hurricane Katrina has revealed that much still needs to be accomplished to provide public safety personnel with the communications tools they need to protect the safety of life and property. We look forward to working with the Congress, the FCC, and other parties in this critical effort.

Thank you once again for the opportunity to appear before you today.

The CHAIRMAN. Thank you very much, Chief.

Our next witness is Dereck Orr, Project Manager of the Public Safety Communications, National Institute of Standards and Technology.

Mr. Orr?

**STATEMENT OF DERECK ORR, PROGRAM MANAGER, PUBLIC SAFETY COMMUNICATIONS SYSTEMS, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)**

Mr. ORR. Thank you, Mr. Chairman.

I was fortunate to have had the great privilege to serve the Senate as a professional staff member of the Appropriations Committee under Senator Fritz Hollings. I am, therefore, sincerely honored to again be able to be here this morning with you and the esteemed members of this committee.

NIST's Public Safety Communications Program serves as the technical lead for several of the Administration's initiatives focusing on communications, most importantly, the SAFECOM program led by Dr. Boyd. Although NIST is helping to improve public safety communications through a number of efforts, many of which Dr. Boyd spoke of, I will focus the remainder of my remarks this morning on the state of standards for public safety communications systems.

Interoperability for public safety communications is defined as the ability to share information via voice, data, on-demand, in real

time, when needed, and as authorized. The public safety community expects that this level of interoperability will be available using equipment from multiple manufacturers, be transparent to the user, require little or no special knowledge of the system, and not be dependent on common frequency assignments. Obviously, this is not what we have today. And, achieving this definition of interoperability in the future will not be possible without the existence of standards.

Of course, public safety radio users have recognized this for some time. Approximately 15 years ago, representatives from local, State, and Federal public safety associations and agencies joined together to address the absence of available standards. They did this for two primary purposes. First, was to ensure that interoperability could be achieved assuming the use of equipment from multiple manufacturers. Second, through standards, the public safety community wanted to be able to take advantage of cost reductions associated with the more competitive land mobile radio market.

The public safety community partnered with the Telecommunications Industry Association (TIA) to serve as the standards development organization for this effort. Thus, Project 25, or P-25, as we know it today, was launched.

A commonly misunderstood aspect of P-25 is that it is comprised of a single standard. Instead, it is a suite of standards that specify the eight interfaces between the various components of a land mobile radio system.

Over the last 15 years, only one of the P-25 interfaces, the Common Air Interface that deals with the functions of the handheld units, has been advanced to a level where it would help satisfy the goals of P-25. But, it alone, cannot provide the level of interoperability public safety is calling for. The remainder of the interfaces either remain undefined or lack enough specificity to allow for a common implementation of the interface; and, therefore, remain proprietary.

An MOU formalizing the relationship between the public safety users and TIA created a steering committee comprised only of public safety and government representatives, and invested that committee with the sole authority to designate a P-25 standard, and did not limit it to only TIA-adopted standards. This is important, because that gives the control of the process to the radio users, and those users have called for immediate results.

The Co-Chair of the P-25 steering committee recently informed the membership of TIA that an agreed-upon Inter-RF-Subsystem-Interface, the ISSI document will be required by January of 2006. The ISSI is extremely important, in that it is the interface standard that will ultimately allow P-25 systems operated by different public safety entities to connect into one seamless network, when necessary. If this January deadline is not met, the steering committee will vote to begin an alternate process for developing an ISSI standard. The steering committee's plan is to issue a call for proposals to fully define an open ISSI standard, select the best proposal, and designate it as the P-25 standard.

This same option can be exercised for all other remaining interfaces as well, if the steering committee is not satisfied with the progress within the TIA process. NIST will continue providing tech-

nical and engineering support to the steering committee so that it can meet its goals and timelines.

In addition, Mr. Chairman, over the last 2 years NIST, with funds from the Department of Homeland Security and the Department of Justice, has tested a number of the handheld P-25 radios that claim to meet the available Common-Air Interface standard. Using the test procedures called for in the standard, NIST found that none of the available radios met all aspects of the standard.

Therefore, NIST, with the support of SAFECOM and the P-25 steering committee, is developing a P-25 Conformity Assessment Program. NIST is preparing and documenting standardized test protocols for the most important aspects of the Common-Air Interface standard. The standardized test protocols will then be provided to NIST's National Voluntary Laboratory Accreditation Program, which can accredit third-party laboratories across the country interested in offering these testing capabilities.

These conformance tests would go a long way in assuring the public safety community that the equipment being purchased meets the P-25 standard.

In summation, Mr. Chairman, there are positive steps being taken by leaders within the public safety community, key Federal programs, the Congress, and industry to significantly change the current environment and move the state of standards for public safety forward. This time next year, there should be newly adopted P-25 interface standards that can be tied to grants and procurements, and radio users will have a mechanism in place to begin to ensure that the products they are purchasing truly do what is called for in the applicable standard.

Again, I am honored to be here before this committee today, and I will be happy to answer any questions that you may have.

[The prepared statement of Mr. Orr follows:]

PREPARED STATEMENT OF DERECK ORR, PROGRAM MANAGER, PUBLIC SAFETY COMMUNICATIONS SYSTEMS, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

Thank you, Chairman Stevens and members of the Committee, I serve as the Program Manager for Public Safety Communications Systems in the Office of Law Enforcement Standards at the National Institute of Standards and Technology (NIST). NIST, a non-regulatory agency within the U.S. Commerce Department's Technology Administration, serves industry, academia, and other parts of the government by developing and promoting measurements, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

NIST's public safety communications program serves as the technical lead for several Administration initiatives focusing on communications, most importantly, the SAFECOM Program led by Dr. Boyd. NIST is involved in many of the key SAFECOM initiatives, including the Statement of Requirements, Public Safety Architecture Framework, testing and evaluation, and standards development. The strong partnership between SAFECOM and NIST is an excellent example within the Administration of multi-agency coordination and collaboration, and is something for which we at NIST are very proud.

I will focus the remainder of my remarks this morning on the state of standards for public safety communications systems.

Interoperability for public safety communications is defined as "the ability to share information via voice and data signals on demand, in real time, when needed, and as authorized." The public safety community expects that this level of interoperability will be available using equipment from multiple manufacturers, that they are transparent to the user, requiring little or no special knowledge of the system, and that they are not dependent on common frequency assignments.

Achieving this definition of interoperability is not possible without the existence of standards that will define how the various components of a public safety communications system will interoperate, regardless of manufacturer. In fact, I would venture to say that in the absence of standards, achieving this level of interoperability would be impossible.

Public safety users have recognized this for some time. Approximately fifteen years ago, representatives from local, state, and Federal public safety associations and agencies joined together to address the absence of available standards. They did this for two primary purposes. First was to ensure that interoperability could be achieved, assuming the use of equipment from multiple manufacturers. Second, through standards, the public safety community wanted to be able to take advantage of cost reductions associated with a more competitive land mobile radio market.

Understanding the difficulty in specifying the complex operations of the various components of a land mobile radio system, the public safety community partnered with the Telecommunications Industry Association (TIA) to serve as the standards development organization (SDO) for this effort. Thus Project 25, or P-25 as we know it today, was launched.

A commonly misunderstood aspect of P-25 is that it is comprised of a single standard. Instead, it is a suite of standards that specify the eight interfaces between the various components of a land mobile radio system (handheld to handheld, handheld to mobile unit, mobile unit to tower, etc.):

- Common air interface—this interface defines the wireless access between mobile and portable radios and between the subscriber (portable and mobile) radios and the fixed or base station radios;
- Subscriber data peripheral interface—this interface characterizes the signaling for data transfer that must take place between the subscriber radios and the data devices that may be connected to the subscriber radio;
- Fixed station interface—this interface describes the signaling and messages between the RFSS and the fixed station by defining the voice and data packets (that are sent from/to the subscriber(s) over the common air interface) and all of the command and control messages used to administer the fixed station as well as the subscribers that are communicating through the fixed station;
- Console interface—this interface is similar to the fixed station interface but it defines all the signaling and messages between the RFSS and the console, the position that a dispatcher or a supervisor would occupy to provide commands and support to the personnel in the field;
- Network management interface—this interface to the RFSS allows administrators to control and monitor network fault management and network performance management.
- Data network interface—this interface describes the RF subsystem's connections to computers, data networks, external data sources, etc.;
- Telephone interconnect interface—this interface between the RFSS and the Public Switched Telephone Network (PSTN) allows field personnel to make connections through the public switched telephone network by using their radios rather than using cellular telephones;
- Inter RF subsystem interface—this interface permits users in one system to communicate with users in a different system, from one jurisdiction to another, from one agency to another, from one city to another, etc.

Over the last fifteen years only one of the P-25 interfaces, the Common Air Interface that deals with the functions of the handheld units (*i.e.*, walkie-talkie), has been advanced to a level where it would help satisfy one or both of the goals of P-25. The remainder of the interfaces either remains undefined, or lacks enough specificity to allow for a common implementation of the interface; in other words, each manufacturer's implementation of the interface is different and proprietary, thus, resulting in systems that do not meet the "interoperability" requirements as defined by the steering committee.

I would like to emphasize that the Common Air Interface is a major step forward and extremely important. It provides a level of interoperability and competition in the handheld market that was not available before. However, it alone cannot satisfy the definition of interoperability that the public safety community is calling for.

An MOU formalizing the relationship between the public safety users and TIA, created a Steering Committee comprised only of public safety and government representatives and invested that committee with the sole authority to designate a P-25 standard. In addition, the MOU stipulates that the Steering Committee has wide

latitude in defining and adopting P-25 standards, and does not limit it to only TIA adopted standards.

To reinforce the need to expeditiously move forward on all remaining P-25 interface standards as prioritized by the Steering Committee, the Co-Chair of the P-25 Steering Committee informed the membership of TIA that an agreed upon Inter-RF-Subsystem Interface (ISSI) document will be required by January of 2006. If this deadline is not met the Steering Committee would vote to begin an alternate process for developing an ISSI standard. The Steering Committee's plan would be to issue a call for proposals to define an open ISSI standard, select the best proposal and designate it the P-25 ISSI standard.

It needs to be made clear that it is everyone's desire that a consensus on these standards is needed and that formal TIA standards be adopted, and that the remaining P-25 interface standards be forthcoming within a time frame that satisfies the needs of public safety users and policymakers at all levels of government.

It is not only important that the various P-25 interfaces are completed in a timely manner, but that a mechanism exist to ensure that products built to the standard, meet all of the requirements of the standard.

Over the last two years, NIST, with funds from the Department of Homeland Security and the Department of Justice, has tested a number of the hand held P-25 radios that claim to meet the available Common Air Interface Standard. Using the test procedures called for in the standard, NIST found that none of the available radios met all aspects of the standard.

NIST, with the support of SAFECOM and the P-25 Steering Committee, is developing a P-25 Conformity Assessment Program. NIST is preparing and documenting standardized test protocols for the most important aspects of the Common Air Interface Standard. The standardized test protocols will then be provided to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), which can accredit third party laboratories across the country interested in offering these testing capabilities. These test protocols would go a long way in assuring the public safety community that the equipment being purchased meets the P-25 standard.

NIST is working closely with the P-25 Steering Committee and manufacturers to ensure that the test procedures are correct and that the results are accurate. In addition, not all aspects of the P-25 common air interface will be immediately available for testing through this program. To begin with, NIST is focusing on some basic functional tests of the radios, which will allow us to get the Conformity Assessment Program up and running. We will then begin to add interoperability tests, as well as tests for more complex radio functions.

In summation, Mr. Chairman, there are positive steps being taken by leaders within the public safety community, key Federal programs, the Congress and industry to significantly change the current environment and move the state of standards for public safety forward. This time next year, there should be new adopted P-25 interface standards and manufacturers will have begun to plan new products lines that incorporate the new standards. Local, state, and Federal agencies procuring P-25 equipment will have a mechanism in place to ensure that the products they are purchasing truly do what is called for in the applicable standard. In conjunction with the other efforts Dr. Boyd spoke of, I am confident that we are making significant headway in the pursuit of communications interoperability.

NIST looks forward to working with this committee, Congress, our Federal partners, state and local public safety officials, and leaders in industry to make this happen. Again, I am honored to be here before this committee today, and I will be happy to answer any questions that you may have.

**The CHAIRMAN.** Thank you very much.

This is a difficult problem for us, because of how much it really interrelates to the difficulty of the spectrum bill we're going to act on this year. I'm trying to get the exact figures, but we were given the figures from CBO that indicate the return to the Government, for the Treasury, would be considerably higher—four to five times higher—if we postponed that date until 2009. We have an enormous demand that this take place no later than 2007, and hopefully in 2006. I don't know yet what the answer is going to be, but clearly we've been required by the budget resolution of this year to raise \$4.8 billion by action of this committee, and the only possible way to do that is by passing the spectrum bill. We hope that will be part of the reconciliation process and that will become law. If

it is not, there will be no funds for interoperability within the coming years.

So, I know we're all wanting to work on that. I've been informed by our staff that the estimate for just radios and equipment for interoperability would be over \$15 billion. So far, our programs call for providing funds through the Justice Department's Office of Community Oriented Policing Services, COPS Program. And I'm told that there has been a substantial amount, around \$92.7 million this year alone, allocated to enforcement agencies on that program. In addition, there was money that came out of other funds. I don't know the exact total of those, but I'm told somewhere around \$900 million, so far, to deal with interoperability.

But, Mr. Orr, I should interrupt to tell you this—you mentioned our dear friend, who's no longer with us, Senator Hollings. I don't know if you were the staffer, but he came back one time and told me he had been in Hilton Head, and a staffer had come up to him and said, "Senator, you've got to go back to Charleston. They're telling lies about you in Charleston." And Fritz told him, "No, I'm going to stay right here, they're telling the truth about me here."

[Laughter.]

The CHAIRMAN. We miss his wit, and we miss his help. And he would be of great help to us on this one now.

But can any of you tell us, What is the ability of local agencies to meet these needs? How much money do we really see that we have to have in the near term, say 5 years, from the Federal Government? Dr. Boyd, do you have any idea?

Dr. BOYD. As you can imagine, that's a really tough question to answer. And the reason it's a tough question to answer is that there's no place in the United States you can go to, to find a picture of what the state of interoperability is in the United States. That's why we're undertaking a major baseline study that will produce results, probably around the middle of next year, that will give us the first genuinely statistically reliable picture of the state of interoperability across the country.

NIST is involved in that activity. We're working closely with the Justice Department and others in doing this work, so that for the first time, we will be able to give you real grounded information about what that status is.

The CHAIRMAN. We're going to have a hearing this afternoon from some of the companies that are involved in manufacturing these systems. I shall not be able to be here, because of the Defense bill on the floor. But from what Mr. Orr says, there's little probability we're going to have "a system" that we could say everyone should use, within the near term. Is that right, Mr. Orr?

Mr. ORR. That would be correct. I think we'll have progress and movement toward more complete standards regarding P-25, but it is still some time before we'll see a full suite of P-25 standards that will be applied.

The CHAIRMAN. My time's almost up, but, Chief, you're the one that's in the trenches on this one. And you're here representing, as I understand, the International Association, right? APCO?

Mr. CARTER. Yes, sir.

The CHAIRMAN. What is the suggestion from your people? What should we do? Should we mandate a series of items and say that

those should be purchased with Federal funds? Should we get involved at all in delineating what will be acceptable use of Federal funds, as far as this interoperability question is concerned?

Mr. CARTER. I believe our perspective, from public safety, is that there may not be any one system that's going to accomplish interoperability nationwide. SAFECOM is doing some tremendous work to identify a variety of issues that we can pull together. But I believe that standards probably will be the answer. Someone's going to have to step up to the plate and say, "This is the standard, and this is what we're going to do."

The CHAIRMAN. Well, we've got standards now, but we haven't got technology to meet the standards.

Dr. Boyd?

Dr. BOYD. Yes, sir, if I might add to that. For some time there are going to be a variety of systems that aren't going to work directly with each other, simply because the total installed base in the field right now is probably—and this is very conservative—somewhere in excess of \$60 billion. The \$15 billion figure you referred to earlier is based on a study conducted 10 years ago that talked only about the portable units and the radios in the car.

So, what that means is that we have to look at a system-of-systems approach. That is, How are we going to make a lot of systems work together? We think we can do that, and the way we're directing the standards, working with NIST and the public safety community, is through common grant guidance, which the public safety community helped us put together, and which helps answer the questions: What will work here? What can you live with, given what you have now and what you know's going to be in place for quite a while?—so that we can use the common grant guidance to help steer all of the Federal grants. That guidance is now incorporated in every Federal grant program. As the standards come available, they'll be locked into that guidance as we continue to tighten the guidance around the standards process.

The CHAIRMAN. Well, Chief, isn't the problem—

I'm running over time, because I've just been called to the Homeland Security Conference on Appropriations, so I'm going to leave. I asked Senator Sununu to Chair. This will be my last question.

Isn't the problem really that if you have a disaster, like Katrina or Rita, or even 9/11, when we call in responders from outside of the zone to come assist and really replace some of those that may be missing or unable to do their job, for one reason or another, isolated by storms or whatever, that the people that come in, they have to be interoperable with what's left there, don't they? I mean, it is a national problem, isn't it?

Dr. BOYD. It's absolutely a national problem. But one of the points we want to make, and the public safety community will expand on this, is that a lot of the elements of interoperability already are there. What we first have to get in place are things like governance agreements and how we're going to work together. The agreements on this—

The CHAIRMAN. Well, let me tell you this. I've been a pilot now for a long time. And when I fly, I get in a plane, and I go from Alaska to California. I just punch different numbers, and I'm totally interoperable wherever I am. I've never been in a plane that

I couldn't reach the ground with, wherever I was, because that's the system of aircraft radios. Why don't we use radios like that for first responders? Why shouldn't you be able to say, you're on channel A if you're in California, you're on channel C if you're in Alaska, wherever—why can't you have this? Mr. Orr, why don't we have those kinds of radios for these people?

Mr. ORR. That was the object—as I said in my opening statement, that was the object of Project 25. I think the issue is that industry has not come to consensus on this issue over the last 15 years, and the bottom line is, it needs closure. We need to finish these standards. Industry needs to come to consensus. Or some other action is going to be taken, as I was talking about during my opening remarks. There are alternative methods to make these standards, through the steering committee. But the bottom line is, industry, to date, has not come to consensus on creating those radios.

The CHAIRMAN. The weather bureau has now given us radio availability that we can turn on wherever we are, as a pilot, and get local weather.

Dr. BOYD. If I may, sir.

The CHAIRMAN. That's interoperability.

Dr. BOYD. I also have a commercial pilot's license, sir. If I may suggest, aviation is on a single band. In any given area, only a few hundred communicators are likely to be involved, and they're under a control system where they talk to the controlled operator. So, they talk under certain circumstances in a relatively small area. So, as control areas, you cross—you know, whether you're on ground control or whether you're on approach, each of those are specified for a region, and they handle a relatively small number of stations.

The public safety community, on the other hand, represents 60,000 individual systems trying to control things and manage things within their own area of responsibility and representing some three million individual public safety operators. So that channels which can be identified in a region to handle a few hundred aircraft, when a channel is applied, for example, in his department, because the adjacent folks can't have that same channel without lots of prior coordination to pull together how that's going to work.

You never wind up—

The CHAIRMAN. It's not the technology problem that he's talking about, then.

Dr. BOYD. Technology is only a piece of it.

The CHAIRMAN. It's a volume of use problem.

Dr. BOYD. Well, it's a combination of issues, I mean, with technology at the center. But most of the things required to achieve interoperability in the near term already exist. They require serious agreements, planning, governance kinds of arrangements across jurisdictions to work. In RapidCom, for example, in ten cities, we were able to establish an emergency command level of interoperability in each city with no new resources, simply by working with these communities, and the communities around each of those cities, to come together to agree on how they're going to approach these things. For example, in the aviation community—

The CHAIRMAN. Well, I've got to leave, but if you move some of those people over to Chief Carter's area, they wouldn't be interoperable with him, would they?

Dr. BOYD. If they've worked out these agreements in advance, they can be. And if we've identified what kind of patching equipment's going to be required, they can be.

The CHAIRMAN. Is there any need for further involvement by the Federal Government, Mr. Orr, in mandating that this come to a closure?

Mr. ORR. Certainly, at NIST we haven't talked about mandating coming, but we are providing all of our resources to give the users involved in Project 25 the technical and engineering resources to finish this out, and, with the support of people and programs like Dr. Boyd and SAFECOM, who will then take those standards that the P-25 steering committee designates and put it in the grant guidance, therefore putting the weight of Federal grants and procurement behind those standards, I do think we can move this forward in a much shorter amount of time than has been.

The CHAIRMAN. I'd call the Committee's attention to the SAFECOM interoperability continuum chart that you have available. I think it's very informative, and we thank you for that.

Thank you very much.

Senator Sununu, will you start?

Senator SUNUNU [presiding]. Thank you, Mr. Chairman.

Not to panic. Senator Boxer and Senator Lautenberg, I don't know which of you were here next, but I'll certainly turn to Senator Boxer, then Senator Lautenberg for questioning.

Go right ahead.

Senator BOXER. Thank you so much. The only reason is that I've got another obligation that started 3 minutes ago. So, I will be brief.

I think, since Senator Stevens told a Fritz Hollings story, I'm going to tell one, too, before he leaves, very quickly.

Fritz, one day, turned to me, he says, "You know why my wife and I get along so well?" And, of course, like a good straight person, I said, "Why?" He said, "We're both in love with the same person."

[Laughter.]

Senator BOXER. And we really do miss him. I was in love with him, too, but—anyway.

Here's the situation. I think we need more spectrum, better equipment, and better coordination. Does anyone disagree that those three things are important?

[No response.]

Senator BOXER. OK. And as I look at it, more spectrum, Mr. Chairman, I think that it does fall on us to make that happen. And we can make that happen as we look at this whole digital question. So, that's one.

Better equipment. We have to help. We cannot unload a \$15 billion problem on the locals. And one that is really—this issue is dictated by our national circumstance. It's our national circumstance that we're a target of terrorists. It's our national circumstance if we have a disaster. This isn't something any State should feel responsible for.

The third one is better coordination, and that's up to the locals. They have to tell us how we can help them do that.

So, I guess my frustration, a little bit—I heard in the Chairman's voice, although sometimes we think we're in agreement, and it turns out we're not, but we might be—in this. Why is it going to take us to 2023, Dr. Boyd—2023—Lord knows where we'll all be then—to get this done? Is there anything we can do, as your helpers, to get this done sooner?

Dr. BOYD. Well, first, let me make clear that 2023 was never identified as the date by which these things would happen. The date comes out of a meeting that we had with the public safety community, where we said, "Look, forget everything that exists right now that you're thinking about, and tell us what the perfect world would be, and let's take 2023 and say, by then, how would you like the world to look? What exactly are all the capabilities you'd like to have?" That doesn't mean we're not interested in trying to make that happen—

Senator BOXER. Well, I hear—

Dr. BOYD.—sooner.

Senator BOXER.—you. I'm glad you—my own view is, we don't have that much patience, those of us here. So, even if it isn't the perfect world, you know, we need to get to some better world, which leads me to my last question, of Chief Carter, which deals with what happened on the ground. In your written testimony, you said that all emergency response agencies in your parish in Louisiana operate on an 800 MHz radio system that provides good interoperability throughout the region. Is that right?

Mr. CARTER. That's correct.

Senator BOXER. However, when some of your personnel went to help in New Orleans, following Hurricane Katrina, they were unable to operate their radios on the State systems due to software incompatibility, a problem that can only be fixed for \$800 per radio, approximately. Is that correct?

Mr. CARTER. Yes, ma'am, that's correct.

Senator BOXER. OK. If your department were to receive—and it might not be your department—if the appropriate departments were to receive sufficient funds to fix all your radios, at \$800 apiece, would that be a good thing for you?

Mr. CARTER. It would be a great thing for us, in the event that we deploy personnel and equipment to an area like New Orleans, for instance, that is so far outside the operational boundaries of our system, yes, ma'am, absolutely.

Senator BOXER. Mr. Chairman, the reason I asked that question is, a lot of times our eyes glaze over when we hear 2023. Here is someone on the ground, Chief Carter, telling us, for \$800 apiece, they can solve a major problem. I don't know why the Senate voted down, three times, money for this. Once was my amendment. So, I—it hurt my heart. I lost by one or two votes. I forgot. One or two votes. Ridiculous. We need to do more, and not wait until 2023.

And I just want to thank the whole panel, because I think you're smart, you're good, and we're going to need you. And why industry can't get their act together is something I don't get. But, certainly, if we, as a Congress, could come together and say, "This is a priority," that should be enough incentive, in a capitalistic society, for

them to step up to the plate with something that's going to help us through all this.

So, Mr. Chairman, thank you very much.

Senator SUNUNU. Thank you, Senator Boxer.

Senator Lautenberg?

**STATEMENT OF HON. FRANK R. LAUTENBERG,  
U.S. SENATOR FROM NEW JERSEY**

Senator LAUTENBERG. Thanks, Mr. Chairman.

Our order got a little mixed here, and because there's pressure with so many things going on, I don't want any of you, at the witness table, to feel that there's lack of interest. There's lack of time, but there's no lack of interest. And I thank you for your testimony.

And coming from New Jersey, where we lost 700 people on 9/11, and a large part of the loss was attributed to the fact that we couldn't communicate, and we had people running upstairs, rescue people—firefighters, emergency service people, and police, trying to get upstairs to help people, and it cost lots of lives of those servicepeople. So, we're particularly in tune with the question of interoperability.

And I want to ask Chief Carter—and, again, thanks for your incisive testimony. Being on the ground there helps identify the problems, and rather quickly. Some cities, there's a wireless network, allows police anywhere in the city to send/receive data, including photographs, car information, fingerprints to and from headquarters in real-time. Now, municipal WiFi, are you familiar with that, Chief Carter? It's the community's ability to have a communications system that may not be available from the conventional commercial channels. Municipal WiFi offers the best opportunity for this kind of technology to spread across the country, and yet some States are blocking cities from setting up their own network.

Are you familiar enough with the WiFi systems to comment on whether or not the municipal networks offer a greater opportunity—more timely—for advancing police communications, at least? That means that they're going to be told what's going on, or in communication with those who are on the street or those who are on the particular assignment at that moment.

Mr. CARTER. In all honesty, I am not familiar enough with that technology to speak to it.

Senator LAUTENBERG. OK. We're looking very closely at that.

And, Mr. Chairman, I'm very hopeful about something that's happening. And I know that you, in particular, Senator Sununu, are very interested in the technology side of things. And that we have the prospect being developed right now of having a satellite communications system through cell phones, instruments as simple as that, that won't worry about the height of the towers that might be destroyed—the cell towers—in a particular moment. So, we're fairly optimistic, very hopeful that that can be part of a solution to the problem.

You know, I come out of the computer industry, and we tried to do whatever we could to advance the technology, et cetera, on our own, but we depended on different elements—manufacture, design, et cetera—to make it all happen. But here we have a problem so complex that I think the government has to be very careful in es-

tablishing standards that industry can meet and talk about without fear of violating any of the rules. And so, we're encouraged by that.

Mr. Chairman, Senator Inouye, who couldn't be here; asks this question, Mr. Orr. An issue that you raise in your testimony is a need for some form of quality control to ensure that the devices marketed and sold as compliant with certain public safety standards are, in fact, compliant. To the point I was earlier making. "Indeed, my staff," he says, "has informed me that you have shared with them a demonstration of how certain public safety radios performed in compliance tests with P-25 standards. And could you tell us something about that testing, and perhaps even give us a brief demonstration of how it works?"

Mr. ORR. Sure. And it was done in a laboratory in Boulder, Colorado, in the Department of Commerce labs. And, simplistically, setting up that test, what it does is, Project 25 radios were developed to be the next generation of digital radios. Currently, the largest percentage of radios out there today, of course, are analog radios. Project 25 is meant to be the next generation digital radio. However—public safety, the manufacturers all understand there's going to be a migration to those digital radios, and there will be a lot of time between now and 2023, or whatever the time is, where you're going to have a mix of analog and digital radios. And the purpose of Project 25, and a part of the requirements of Project 25, is that it is backward compatible and can operate with—both in the digital environment and the analog environment. And so, you should be able—and are supposed to be able, with a Project 25 radio, to be able to operate right—in contiguous bands and contiguous channels with an analog radio and an analog channel, and without having any interference between the digital and the analog channels.

What this test is, is of two radios, one operating in—well, they're operating in analog mode, and they're getting a digital interference signal, and it shows you what would happen currently with the P-25 radios if they were operating in a situation where there were digital and analog channels adjacent to each other. And, again, in the statement requirements for Project 25, these radios should have no problem doing what they're supposed to do, which is being audible.

And so, the first sound file I'll play, you will actually be able to hear the voice.

[Audio played.]

Mr. ORR. So, that's a person in wideband analog mode on a Project 25 radio, getting some minimal interference from an adjacent channel operating in digital mode. You can still hear the voice.

The next radio is another Project 25 radio, same circumstances.

[Audio played.]

Mr. ORR. So, obviously there's a wide variation in how the standard is being implemented. Now, this demonstration isn't meant to show that there are radios out there that are causing lives lost. Obviously, very few radios out there today are Project 25, so you don't have a situation where you have a whole lot of ultra-wide—or wideband—or analog and digital radios operating in adjacent channels. However, as we start to migrate to digital, you will start to have

that, and buyers won't even know whether or not their radio is going to allow them to operate the way they expect it to operate.

And so, what we're doing is creating a conformance testing program, along with SAFECOM, that will allow public safety to make correct buying decisions based on what their needs are from the radio, and understand how they operate.

Senator LAUTENBERG. Mr. Chairman, I ask unanimous consent that an opening statement that I would have made be included in the record.

And I assume that the record will be kept open for questions. We've run out of time, and I don't want to overuse mine.

Senator SUNUNU. Without objection, so ordered.

[The prepared statement of Senator Lautenberg follows:]

PREPARED STATEMENT OF HON. FRANK R. LAUTENBERG,  
U.S. SENATOR FROM NEW JERSEY

Mr. Chairman,  
9/11 revealed serious problems with our ability to communicate during a disaster. When firefighters and police couldn't talk to one another, we all became familiar with the term "inter-operability."

Hurricane Katrina gave us another wakeup call.

It reminded us that before we can have inter-operability during a disaster, we need operability.

After last month's deadly storm, almost all of the communications systems that we take for granted were shut down in the affected region.

The wireline telecommunications network sustained enormous damage. According to BellSouth, the largest wireline provider in the region, more than three million phone lines were knocked out of service.

Local wireless networks also sustained considerable damage as thousands of cell sites and many wireless switches were knocked out of service.

Radio and TV broadcasters play an important role in providing information during an emergency. But of the 41 broadcast radio stations located in New Orleans and the surrounding area, only two AM and two FM stations remained on the air immediately after the storm.

This event made clear that we need a backup plan for communications during a disaster.

We need "redundancy" in networks, including the 9-1-1 emergency system, and we need alternative sources of power.

I would encourage this committee and the FCC to consider how we put in place redundant systems that can withstand disasters—both natural and terrorist.

These could include satellite communications and VoIP telephone service such as that provided by Vonage, and other technologies.

The big lesson that we must learn from this disaster is that we can never be too prepared.

Thank you, Mr. Chairman.

Senator SUNUNU. Let me ask a few questions here about the P-25 standard. I don't know a great deal about some of the technological developments that you're discussing, but you talked a lot about conformance testing and standard development and certification. This is a process that began 15 years ago, correct?

Mr. ORR. Correct.

Senator SUNUNU. And I will use the word "you" here, but I understand "you" haven't been working on it the whole time. You're not responsible for all of this. There are obviously a lot of people. So, I don't want you to take my line of questioning personally.

How much money has been spent on the project over the last 15 years, roughly?

Mr. ORR. I really can't answer that, because the project itself is an industry project. It's completely industry-driven. However, it

does have that public safety contingent that I talked about. From a Federal perspective of how much support we've been given, I would estimate maybe \$2–3 million. And we've only been involved lightly up until—

Senator SUNUNU. So, the Federal support is relatively modest. Obviously—

Mr. ORR. Right.

Senator SUNUNU.—the big cost is going to be in replacing all of these radios.

Mr. ORR. Yes.

Senator SUNUNU. There are eight interfaces that you're trying to standardize. Only one of the eight has been developed so far, correct?

Mr. ORR. Correct.

Senator SUNUNU. How much longer is it going to take to develop the other seven?

Mr. ORR. What we've done is, we've worked with and assisted the public safety community, the steering community involved in P-25—to prioritize the remaining interfaces, which ones are most important that need to be covered. They have declared to the industry, "Stop working on all other interfaces except the following." And so, right now, the next one teed up—there are two teed up. There's actually a fixed-station interface. But the most important one is the ISSI I spoke about in my opening statement. And that—the fixed-station, they expect to have a standard, or at least a de facto standard, done October, so next month, which is a major achievement for Project 25. And then the ISSI, which is a very major achievement, they're expecting to have a document that can be balloted and voted on by January—done by January and balloted and voted by March.

Senator SUNUNU. Realistically, a couple more over the next 12 to 18 months.

Mr. ORR. I would be very happy if we got three over the next—

Senator SUNUNU. OK.

Mr. ORR.—12 months.

Senator SUNUNU. So, we're talking about a time frame of, frankly, years to complete all eight. And then, obviously, the purchase of compliant equipment, radio equipment's going to be required. Did you have an estimate for the total cost for people to comply with this standard and meet the standard?

Mr. ORR. It should be fairly low. First of all, the current plans for the conformance testing is that NIST—

Senator SUNUNU. No, no, no, I'm talking about replacing the radios.

Mr. ORR. Oh.

Senator SUNUNU. We're talking about billions—

Mr. ORR. No, no. We—

Senator SUNUNU.—of dollars—

Mr. ORR. Yes, absolutely.

Senator SUNUNU.—\$10, \$15, \$20 billion, something like that. OK. I mean, my question is, for all of this work that has been done, starting a 15-year time frame—granted, the development's going on now—whether or not the whole approach is, quite frankly, outdated. You know, this is a device that has IP capability. And,

granted, this is not a public safety communication device. But the idea is that this can communicate to anyone else with an IP address, anywhere in the world, let alone anywhere in the country. And, obviously, depending on my access to the IP network, it could be WiFi, it could be the municipal network Frank Lautenberg is talking about, it could be a local area network on a wireless, it could also be a wire-based. But it's an IP device. The IP protocol has obviously proven itself to be pretty robust, pretty capable. It's an existing interface standard, if you will, that can be enhanced by different features.

It seems to me it would be a little bit less expensive, a little bit more straightforward, to implement a system using that kind of an interface, rather than try to develop, standardize, test, adopt standards, and then have to have everyone spend a great deal of money to replace all of these radios. What is wrong with that thinking?

And, Dr. Boyd, why don't we let Mr. Orr respond, but I'm certainly very interested in your response to that, as well.

Mr. ORR. They will probably be very similar, I would imagine. I would just say that, on your statement, much of Project 25, as it moves forward, is IP-based. We are basing it on available IP standards, and it will be based on the kind of technologies that you're thinking of, as well.

Senator SUNUNU. So, given that, why is this taking so long, and why are we presupposing that so many devices out there have to be, sort of, switched out or will be rendered non-compatible? Obviously, there are a lot of radios out there that aren't IP-compatible. But why are the costs of implementation assumed to be so high, given that there's such a large and growing number of IP-compatible networks out there now?

Mr. ORR. The hope is that once a system like Project 25, based on IP, is implemented, it will actually bring down the costs, and they will be able to reap the benefits of the kind of cheaper equipment that people—that consumers today are able to take advantage of in the marketplace.

Senator SUNUNU. Dr. Boyd?

Dr. BOYD. The IP-based approach that the commercial networks use is predicated on a number of things that don't fit well in the public safety environment. One is an infrastructure which is largely wired or fiber or connected on that basis, so that they don't have weak signal problems and they don't have time-of-arrival problems over large distances, as you will tend to have in IP radio—many of those things haven't yet been adequately—

Senator SUNUNU. Time-of-arrival problems?

Dr. BOYD. OK—

Senator SUNUNU. Are you talking about—

Dr. BOYD.—if you have a packet—

Senator SUNUNU.—wait packet?

Dr. BOYD.—if you have a series of packets, the series of packets are transmitted from a device. A packet is really what IP is transmitting. That the order in which they arrive, and how often they arrive, begins to create all kinds of problems. Some are issues associated with collisions. Those are managed by routers and by servers in the cellular system. And cellular systems are designed around

an infrastructure that has a relatively short range. Cellular is in a fairly small box.

The public safety guys, on the other hand, have to serve the entire county. And they can't—they have some trouble in relying on a commercial infrastructure, which is probably one of the first things that will collapse, because these are infrastructures that are traditionally built to about a 10 percent overcapacity. In fact, we exceed that normally during rush hour every afternoon.

Senator SUNUNU. Well, I understand your point about not necessarily wanting to rely on an exclusively commercial infrastructure, but I seem to say—or you seem to say that there are latency problems that wouldn't make an IP system effective over an area larger than a county.

Dr. BOYD. No, I'm not saying that. What I'm saying is, there are more technical problems there than—in this kind of environment than you're going to find in the cellular or the wired environment.

I think the critical point I'd make is that, whatever system you decide to put in place has to meet their requirements. What I told industry recently was, there are lots of opportunities for commercial activities, whether it's IP-based or satellite systems or others—

Senator SUNUNU. But what—

Dr. BOYD.—that help provide—

Senator SUNUNU. I'm sorry. I apologize for interrupting, but you seem to use the words "commercial" and "IP" interchangeably.

Dr. BOYD. No.

Senator SUNUNU. And just because something is IP doesn't mean it's commercial.

Dr. BOYD. No. That's correct.

Senator SUNUNU. OK.

Dr. BOYD. But if you go to IP, remember that there are very few IP-capable radios currently in the field.

Senator SUNUNU. I suppose—

Dr. BOYD. In public safety.

Senator SUNUNU.—in public safety. And, I mean, quite frankly, I have to wonder if that's, in part, because of all of the micro-management and manipulation that's—well intended, but all of the micro-management and manipulation that comes from—whether it's Federal level or State level—but us trying to force a standard on them, and whether or not that discourages some of the innovation and adoption of new technologies when they're available. I don't know that that's the case, but I think it's a question that is certainly worth asking.

Dr. BOYD. I think you've made the most critical point to be made here. I think, in fact, you've made it—

Senator SUNUNU. Well, now you're just—

Dr. BOYD. No, I think you've made—

Senator SUNUNU.—drawing on flattery.

[Laughter.]

Dr. BOYD. You have made exactly the case that we've been arguing for, for some time—and I think Chief Willis and others will agree—and that is that we believe this has to be driven by the first responders themselves, that it's not appropriate to tell them what they have to have. We should be listening to them. We should be

listening to what their requirements are. Then we should be responding to that. And that's the way we've built the entire SAFECOM program, so that Chief Willis and APCO, for example, are critical players in helping to do exactly those things.

But, I agree with you, it has got to be driven at that level. It can't be pushed down on them.

Senator SUNUNU. Thank you, Dr. Boyd.  
Senator Pryor?

**STATEMENT OF HON. MARK PRYOR,  
U.S. SENATOR FROM ARKANSAS**

Senator PRYOR. Thank you, Mr. Chairman.

I want to ask, if I can, about just a mechanical aspect of what we saw in Katrina. It's my understanding that some of the systems that were in place down there on the Gulf Coast, as I understand it, were designed to withstand a hurricane, and to survive a hurricane. And my impression is, many of these systems, that were supposedly hurricane proof, failed. In fact, I saw some towers—you all have seen the pictures where all the towers are just bent over, broken in half, basically. And so, my question, for whoever wants to take it, is, first, Is that assumption correct, that there are systems down there in place that were supposed to be hurricane proof? And, second, if that's the case, what happened to them? Why did they fail?

So, who wants to answer that?

Mr. CARTER. I believe that there were a number of systems in south Louisiana. As a matter of fact, all those systems were designed to be hurricane proof to some degree. I'm not totally sure that they were designed to be hurricane-proof to the degree that Katrina hit us. As far as the damage, the wind, of course, is one of the causes that damaged the radio networks. Following the wind, the break of the levees caused the flooding, which, of course, then knocked the power out. So, there were a number of issues that caused many of those sites to fail. The wind, of course, initially, for a lot of them. And I, too, saw—when I went on my trip down there, radio towers that were basically broken in half. So, I can only assume that, although those towers were designed for hurricane-force winds, they were not designed for a Category 4 or 5, which is what we actually got.

Senator PRYOR. When I see that, I think, if they are designed for hurricane-force winds, you know, I'd be curious about seeing the specs on what they were designed for. And, second, I'd be curious about what the marketing was for the companies that sold these systems to the localities down there, to the various companies and governments, et cetera.

And, third, I would want to know about any—not so much design defects, in that maybe they weren't designed properly—and maybe they weren't, but I'd want to know about that—but I'd also want to know if there were issues of rust or wear-and-tear or lack of maintenance, you know, those types of things. Now, are you familiar with—can you answer any of those questions for me?

Mr. CARTER. No, sir, probably not, especially not specifically to the systems in the south part of the State.

Senator PRYOR. OK. Does anybody else want to take a stab at any of that? Any impressions that you have?

Dr. BOYD. Of course, these systems are managed locally, so that's the right place to go to, to ask that kind of question.

Senator PRYOR. Right. In other words, we'll have to get inside of the facts of each specific case to see.

Also, my impression is that some of the systems failed maybe due to lack of planning, and, to some extent, lack of design, because—I've heard something very practical—that generators were down on the ground level, even in basements, and they flooded. And, you know, of course, they lost their power source. Are you all familiar with those stories, as well? Are those stories true? And, you know—

Dr. BOYD. I can tell you, there's a major effort in the Department to collect lessons learned and that kind of information. And so, the Department is going to be talking about the kinds of things they found. But it's still a little early for us to know what those things are. Right now, it's the recovery effort that's most important.

Senator PRYOR. Sure.

Well, we've heard a lot of—like you, we've heard a lot of anecdotal stories about things that went right and things that went wrong. And so, part of what we are doing here is the oversight of all this.

One thing, by the way, I want to say—I know we have to take a break here in just a moment, Mr. Chairman, because we have to vote on Judge Roberts here, momentarily—but one thing I'd like to say is, some of the companies have really done a great job after Katrina to try to, not just restore services to their people, but also some of the nuts and bolts of even suspending billing during this time, you know, things like that. And some of these companies, I think, really do deserve quite a bit of credit for the actions they've taken in the aftermath of Katrina.

Mr. Chairman, I do have a few more questions, but maybe it might be better if we submit those for the record, given the shortness of our time here.

Senator PRYOR. And supposedly, as I understand it, the leadership would like us to be over there before the vote starts.

Senator SUNUNU. The Senator is correct. And, without objection, the record will be held open for 2 weeks, so that Members may submit additional questions.

Senator SUNUNU. Any other comments or questions, Senator Pryor?

Senator PRYOR. No, thank you.

Senator SUNUNU. I had one final question for Mr. Moran. How much spectrum is available exclusively for public safety use? Is 97 MHz the right number?

Mr. MORAN. At the present time it's not the right number, because the 24 MHz in the 700 band, at this point, in many parts of the country, is not usable exclusively for public safety because of the broadcast issues—

Senator SUNUNU. OK.

Mr. MORAN.—that you've mentioned earlier.

Senator SUNUNU. So, that'll be a correct number once we complete our work and—

Mr. MORAN. Yes, it will be.

Senator SUNUNU.—pass a—

Mr. MORAN. Yes, it would be.

Senator SUNUNU.—a transition bill.

Thank you very much. Thank you, to all of our witnesses.

The hearing's adjourned.

[Whereupon, at 11:17 a.m., the hearing was adjourned.]

## A P P E N D I X

### PREPARED STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Mr. Chairman, thank you for holding today's two hearings on communications in disasters.

Last week, Members of this committee raised multiple communications issues and proposed various solutions.

I have focused many of my efforts on a couple proposals that I think could make a huge difference to our Nation's emergency 9-1-1 system and make our citizens safer during disasters.

One of the tragedies caused by Hurricane Katrina was the crippling of the 9-1-1 emergency network. Key 9-1-1 centers were either knocked out by water or were overloaded with calls. This left citizens with no way to call for help and it severely hampered rescue efforts.

Because the current 9-1-1 system doesn't have built-in redundancies, once a local 9-1-1 center fails, there is no backup. But digital technology can fix this problem.

S. 1063 (which I introduced and is cosponsored by Senators Burns, Snowe, Clinton, and Kerry) would require the Federal Government and industry to develop a plan to quickly move the Nation's emergency networks from the old analog system to a more robust, Internet-based network. This updated system would allow emergency phone calls to be automatically rerouted from a damaged 9-1-1 call center to the next nearest call center. LIVES WILL BE SAVED.

This bill also ensures that the millions of people who use Internet phone service would be able to have full E-9-1-1 capabilities.

I thank the Co-Chairs of this committee for their supportive words about S. 1063, which was introduced last May. The recent hurricanes show that it's time for this committee to pass this bill and move it to the full Senate.

I look forward to hearing the witnesses, and I thank the Chair.

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### PREPARED STATEMENT OF HON. DANIEL K. INOUYE, U.S. SENATOR FROM HAWAII

Today, the Committee continues its examination of the effectiveness of our Nation's communications networks in the wake of Hurricanes Katrina and Rita and now turns its attention to the communications challenges faced by first responders in times of crisis as a result of the devastation caused to the physical infrastructure and the lack of interoperable equipment.

While today's hearing will inevitably focus on how to ensure communications "interoperability," among first responders, we must not lose sight of the fact that New Orleans had in place an interoperable communications system, but when the basic communications capabilities failed that system was rendered useless. Therefore, even if interoperable communications systems are developed and deployed, they will provide little help if the communications network itself does not survive the disaster.

A key step to ensuring that the Nation is prepared for the next disaster requires us not only to focus on obtaining the latest and greatest technology, but also on building and maintaining resilient networks. I hope that the witnesses today will help us understand what steps can be taken to ensure that terrestrial networks are constructed with foresight to anticipate and harden against failures. Additionally, this Nation must plan for worst-case scenarios by integrating redundant systems, both terrestrial and satellite, for situations where the best laid plans fail to prevent communications outages.

Turning to the crisis-level lack of interoperability that has plagued our first responders since September 11, Congress must make policy decisions that will stimulate the development and deployment of emergency ready, interoperable, redundant wired, wireless and satellite networks. The lack of interoperability cannot blithely be blamed on a single issue. This breakdown is occurring on several levels.

To ensure robust interoperability, in the most basic terms, there are several key elements that must be addressed. First, we need to ensure that proper planning, coordination and training exercises are implemented in advance of a disaster. To have emergency readiness, we must be emergency tested. Second, we need technology that is capable of communicating seamlessly between and among the affected first responders at the local, state and Federal level, regardless of equipment or frequencies utilized. Third, we need to allocate the necessary spectrum to enable robust communications systems to be built. Fourth, we must establish a system of quality control to ensure the technology developed for use in these systems is reliable. Finally, we need to provide funding to deploy and maintain these systems. None of these elements alone will solve our interoperability failures. They must all be addressed in a coordinated manner or leave our Nation vulnerable in the face of future disasters whether natural or man-made.

I look forward to the testimony of the witnesses.

